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## Abstract

# Drug Resistant Tuberculosis: An Emerging Public Health Threat in Yemen, 2014-2016

Jihan Abdalmughni; E Mahyoub; A Al Agabri; Y Abdulwareth; A Al-Serouri

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Jihan Abdalmughni

## Abstract

**Background:** Drug-resistant tuberculosis (DR-TB) is a serious obstacle for successful TB control. The 2010–2011 Yemen DR-TB Survey showed an overall Multi DR-TB (MDR-TB) prevalence of 2.9% that was 1.4% in newly- and 14.4% in previously-treated patients. DR-TB Surveillance system was introduced in Yemen in December 2013 to improve detection and management of DR-TB.

**Objective:** To describe the pattern, drug sensitivity and treatment outcome of DR-TB.

**Methods:** Data on DR-TB cases from 2014 to 2016 was obtained from National Tuberculosis Control Program (NTCP). The NTCP modified WHO case definitions for treatment outcome was used where treatment success defined as completing treatment according to program protocol with at least five consecutive negative smears from samples collected at least 30 days apart in the final 12 months of treatment.

**Results:** Out of 32,528 TB patients diagnosed during 2014 -2016, 115 (4/1000) were DR-TB. The highest number was reported from Aden (40%) and lowest from Taiz 12%; 59% among males; and 67% among most productive years (24-45 years). Furthermore, 97% was among previously treated TB patients and 3% was positive for HIV. MDR-TB confirmed in 68% and Rifampicin Resistance (RR-TB) in 31%. The treatment success rate was 70% and death rates was 15%. Detection and enrollment rates were 27% and 80%.

**Conclusions:** Despite NTCP efforts to respond to the challenge of DR-TB in Yemen, scaling-up of DR-TB services and removing the access barriers are crucial to increase the detection rate. Comprehensive strategies targeting priority population especially those enhancing treatment availability need to be implemented to increase enrollment. More intensive efforts to better manage MDR/RR-TB through adapting WHO shorter recommended regimen and inpatients management for those requires hospitalization will help to improve the treatment success and minimize further emergence of totally drug-resistant TB cases.

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## Abstract

# Evaluation of Drug-Resistant Tuberculosis Surveillance System Before and After Implementing Genexpert in Morocco, 2007-2016

Kenza Bennani; G Bukassa; A Khattabi; M Akrim; A Maaroufi

## Corresponding Author:

Kenza Bennani

## Abstract

**Background:** Drug-resistant tuberculosis (DR-TB) is a serious problem in the fight against tuberculosis worldwide. WHO has been actively encouraging countries to establish continuous DR-TB surveillance systems based on routine drug susceptibility testing (DST). In Morocco, a DR-TB surveillance system was implemented to monitor and to control epidemiology of Multidrug-resistance TB (MDR-TB). Genexpert for Rifampicin resistance detection was introduced in 2012, to scale up of national surveillance system.

**Objective:** Our study aims to evaluate DR-TB surveillance system before and after implementing Genexpert.

**Methods:** This is a retrospective descriptive study with a quantitative approach, to assess the data quality, sensitivity (ability to detect MDR-TB cases compared to cases estimated from national MDR-TB survey) and the PPV of the surveillance system, using data reported from 2007 to 2016 and laboratory results for Genexpert and Conventional DST, as gold standard, to validate the data collected.

**Results:** 1063 DR-TB cases confirmed reported from 2007 to 2016, among them 92% were MDR-TB. The missing data for the variables assessed represented 11%. It was important for DST results (32%) and treatment outcomes (34%). The sensitivity of DR-TB surveillance system was low (17% on average) before introducing Genexpert (2012) and reached to 70% since 2015. In 2016, the sensitivity was 100% for detection of MDR-TB among patients previously treated for TB and 29% among new TB patients. The PPV of DR-TB surveillance system was 34% before introducing Genexpert (2012) and reached to 99% in 2016.

**Conclusions:** The current DR-TB surveillance system based on active case detection was satisfactory for data quality, sensitivity, and PPV. This is related to introduction of Genexpert since 2012. It's recommended to strength MDR-TB detection among new TB cases using Genexpert and to maintain MDR-TB detection among patients previously treated for TB to improve the sensitivity of the DR-TB surveillance system in order to establish continuous DR-TB surveillance system.

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## Abstract

# Evaluation of Drug Resistant Tuberculosis (DR-TB) Surveillance System in Balochistan Province, 2016

Farida Khudaidad; A Saeed

## Corresponding Author:

Farida Khudaidad

## Abstract

**Background:** Eight million people are infected and 3 million die due to TB every year. Pakistan ranks 5th amongst 22 High burden countries with TB and 4th among 27 DR-TB high burden countries and accounting for about 81% of all estimated TB cases worldwide. Pakistan contributes about 65% of TB burden in Eastern Mediterranean Region. In Balochistan patients are filtered from chest and medicine OPDs of tertiary care hospitals and from Basic Management Units (BMU) of districts, sputum of eligible DR-TB patient is sent by transportation mechanism. Diagnosis of DR-TB requires Gene-Xpert testing, available at 04 Programmatic Management Drug Testing (PMDT) sites.

**Objective:** An evaluation of MDR-TB surveillance system was conducted to identify strengths and weaknesses of surveillance system and make recommendations for improvements.

**Methods:** Evaluation was performed during March-July 2017 for year 2016. Qualitative and quantitative assessment of system attributes utilizing the Updated CDC Guidelines for Evaluating Public Health Surveillance Systems, 2001 was conducted. A desk review of all available departmental reports and literature was undertaken. Stakeholders were identified, and interviews were held using a semi-structured questionnaire.

**Results:** Case Definition is simple and uniform. System is less flexible but able to integrate with other systems. Data quality is good as 95% forms found complete. Reporting is based on clinical Signs and symptoms and confirmation with gene expert, DST and culture. Acceptability is good, has good coordination with other health systems. Timeliness is good as reporting is within 24-48 hours. System is stable and secure because of timely response. Representativeness is good as 80% public and private sectors are involved. Sensitivity and PVP calculated was 73.4% and 100% respectively for year 2016.

**Conclusions:** System is working effectively at PMDT sites, but Response of private sectors is poor. Recommendations were to sensitize private doctors and paramedics around the province about DR-TB. To increase public private collaboration.

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Abstract

# Evaluation of Risk Factors for Developing Multidrug Resistant Tuberculosis in Rural Islamabad, Pakistan

Mir Muhammad Hassan Bullo; A Baig

**Corresponding Author:**

Mir Muhammad Hassan Bullo

## Abstract

**Background:** Multi Drug Resistant Tuberculosis (MDR-TB) has emerged as a public health issue globally and especially in developing countries. An adequate and baseline epidemiological information on MDR-TB is critical for effective control and prevention of MDR TB.

**Objective:** To evaluate the risk factors for developing MDR-TB among the patients registered under TB-DOTS at Federal General Hospital (FGH) Islamabad.

**Methods:**

**Results:** Among total of 27 cases 14 (51%) were male. The mean age of the cases was 31 years (range 13-61 years). Most of the cases belonged to age group 20-30 years n=11 (40.7%). On bivariate analysis, out of a total of 27 cases, 07 were found to have defaulted from TB treatment, (OR 6.71, CI 1.7-25), 12 had a contact with MDR TB patient (OR 5.6, CI 2-15), 22 had a poor socio-economic status (OR 3.1, CI 1.1-9.2) and 14 had poor knowledge about MDR-TB (OR 2.8, CI 1.1-7.4).

**Conclusions:** ATT failure, contact with MDR-TB patient, poor knowledge about MDR-TB were found to be associated with having MDR-TB. Awareness campaigns at an institutional and patient levels was recommended. On recommendations of this study awareness campaign was started in FGH regarding significant risk factors for MDR-TB.

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Abstract

# Evaluation of Multi Drug Resistant Tuberculosis Surveillance System, Yemen

Jihan Abdolmughni; Y Abdulwareth; A Al Hamady; E Mahyoub; A Alagbari; A Al-Serouri

**Corresponding Author:**

Jihan Abdolmughni

## Abstract

**Background:** Developing Multi Drug-resistant TB (MDR-TB) is a threat facing the National Tuberculosis Control Program (NTCP) in Yemen. Four sentinel Surveillance sites were established in 2014 to monitor the situation and guide control.

**Objective:** Assess the performance of MDR-TB Surveillance and provide recommendations.

**Methods:** We use the Center of Diseases Control (CDC) updated guideline for evaluating public health surveillance systems. In-depth interviews were conducted with six NTCP and 12 central and regional MDR-TB Centers managers/staff. We used 5-Likert scale to assess performance by attributes (e.g. usefulness, simplicity, flexibility) according to the following scoring system: Poor (<60%), average (60-80%), and good (>80). NTCP-modified WHO case definitions for treatment outcome was used where treatment success defined as completing treatment according to protocol with at least five consecutive negative smears from samples collected at least 30 days apart in the final 12 months of treatment.

**Results:** MDR-TB Surveillance System achieved good performance in usefulness, acceptability and data quality compared to average score in flexibility and simplicity; and poor score in stability. Detection rate was 25% in 2014 and increased to 32% in 2016 compared to the target of 40%. Enrollment decreased from 92% in 2014 to 69% in 2016 compared to 100% target. Treatment success reached 70% in 2016.

**Conclusions:** MDR-TB surveillance system was found to be useful, but more efforts is needed to improve stability through ensuring constant power supply for the laboratory to be able to perform drug sensitivity with gradual replacement of donor's funds by government. Although detection rate showed some increase in 2016, enrollment decreased due to unavailability of MDR-TB drugs and long waiting list. Scaling-up of MDR-TB services and removing access barriers are crucial to increase detection rate together with enhancing treatment availability to increase enrollment are recommended. Adapting WHO shorter regimen and inpatients management when needed will help to improve treatment success.

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Abstract

# An Analysis of Interventions Presented at the 2015 CDC EIS Conference and the 2015 TEPHINET Conference

Abdul Rauf Shirzad

**Corresponding Author:**

Abdul Rauf Shirzad

## Abstract

**Background:** Field Epidemiology Training Programs, TEPHINET, and the CDC EIS Program concentrate almost exclusively on nonintervention epidemiology. Fields of health services research that concentrate on interventions such as randomized controlled trials or operations research are seldom taught. We believe this is a mistake; unless interventions are performed, health and healthcare are not improved. We analyzed the oral presentations of the 2015 EIS Conference (2015 EISC) and the 2015 TEPHINET Conference (2015 TEPHINETC) to determine how frequently interventions were performed.

**Objective:** To determine the frequency that authors perform interventions.

**Methods:** Three reviewers read abstracts. Two reviewers read the 2015 EISC and two the 2015 TEPHINETC. Abstracts were judged to have had an intervention or not and, if so, whether the principal intention was to present an intervention (primary intervention) or, if the intervention followed a noninterventional epidemiology investigation, a secondary intervention. Abstracts were then graded by whether the presenters called for an intervention to be done or not (intervention needed). Discrepancy in scoring was resolved by discussion.

**Results:** Neither set of abstracts contained the words randomized controlled trial, operations research or operational research. The 2015 TEPHINETC contained 126 presentations, of which 28 (22.2%) contained an intervention (three primary, 2.4%; 25 secondary, 19.8%). Eighty-five abstracts (67.5%) called for an intervention to be done. The 2015 EISC contained 103 presentations but we have been able to read to date only 61. Of these, 11 (18.0%) contained an intervention (three primary, 4.9%; 8 secondary, 13.1%). Thirty abstracts (49.2%) called for an intervention to be done.

**Conclusions:** CDC and TEPHINET do not emphasize intervention epidemiology. While the need for an intervention is highlighted by CDC and FETP authors, it is unclear who will do those or if they will be done. We believe FETP and CDC EIS training programs should be revised to emphasize intervention epidemiology.

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## Abstract

# Empowerment of Public Health System in Rapid Response and Early Detection by Building Front-line Epidemiological Capacity - Egypt, 2017

Hala Saad; S Elshourbagy; H Abu Elsood; S Refaey; A Kandeel

## Corresponding Author:

Hala Saad

## Abstract

**Background:** The Egyptian Ministry of Health (MoH) launched Public Health Empowerment Program-Basic Field Epidemiology (PHEP-BFE). PHEP-BFE is a three-month in-service training program that focuses on detection of and response to diseases and events of public health concern. In July 2017; first training course was conducted for first cohort and graduation was in October 2017.

**Objective:** We aimed to raise the epidemiological capacity of sanitarians due to their valuable contribution in detection of and response to public health threats and evaluate program effectiveness.

**Methods:** A team from MoH was assigned for planning, preparing and rephrasing of training material to fit Arabic language. Material from the Front-line Field Epidemiology Training Program (FETP), referenced by CDC, was used for developing parts of the curriculum. Inclusion criteria for participants were applied. Three workshops were conducted, and participants were asked to conduct field activities after each workshop. Each participant was supervised by a mentor. Evaluation approaches and tools include; documents review, questionnaires and check lists. Instructors, Mentors and Participants were asked to complete an evaluation tool after each workshop and fieldwork. Data was collected and analyzed.

**Results:** Out of 27 Participants joined the program, 25 (92.6%) were graduated. All participants were males aged from 24-50 years. Out of 25 participants, 19 (76.0%) were at directorate level. During their fieldwork, 22/25 (88.0%) noticed low surveillance reporting at district level, and 15/25 (60.0%) participated in outbreak investigations. By the end of training; knowledge of subject of epidemiology was improved, the difference between results of pre- and post-test raised by (30.4%)  $P < 0.0001$ . All participants gained presentation skills and were able to write scientific reports. Yet 16/25 (64.0%) participants need practicing data analysis on Microsoft Excel during training workshops.

**Conclusions:** PHEP-BFE was successful and met its objectives. PHEP-BFE could target sanitarians at district level. More time could be dedicated for statistical skills improvement.

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## Abstract

# How Did Data Visualization Identify and Improve Response to an Enteric Fever Outbreak in Syria?

Ranya Ahmed

## Corresponding Author:

Ranya Ahmed

## Abstract

**Background:** Population displacement and damage to infrastructure in Syria has contributed to an increase in water borne infectious diseases including enteric fever. The collection, presentation and analysis of data collected in real time is therefore vital for early identification of outbreaks. EWARN and EWARS are used in Syria for the reporting of communicable diseases however this is not always available to facilities in real time. As such, the prompt availability of diagnostics and treatment may be lacking. This is vital for enteric fever where morbidity and mortality without appropriate treatment is high.

**Objective:** In this study, we examine the utility of a data visualization tool to track cases of enteric fever in three facilities supported by the Syrian American Medical Society (SAMS).

**Methods:** All cases of enteric fever between March 2017 and July 2017 were tracked in near real time and presented using data visualization software, namely Tableau. Tableau is a visualization software generally used within the business sector, but its ability to visually express data has far reaching potential in the realm of public health. Sites in Daraa, Quneitra and Rural Damascus were included. Close communication with data personnel in SAMS country offices and health workers working in the facilities was maintained.

**Results:** In March 2017, there were 21 cases of enteric fever across the three governorates and in July 2017, this had increased to 784 cases. Close liaison with the teams on the ground identified that facilities were seeing a significant increase in cases and that there was a shortage of appropriate antibiotics to treat patients. It was also apparent that there was a shortage of microbiology facilities which could isolate the causative organisms (*Salmonella typhi* or paratyphi) and therefore limited ability to identify the susceptibility of the organisms resulting in empiric therapy where available. Using data visualization in real time can allow for preparedness and responsiveness to outbreaks of communicable diseases during the conflict.

**Conclusions:** Visualization should be integrated into online and offline data collection tools in order to create an early warning system on each device used in the field.

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## Abstract

# The Growing Antimicrobial Resistance of Urinary Tract Infections, Sana'a- Yemen, 2015

Yasser Ghaleb; A Al Serouri; M Alamad; S Nasher; A Alsoumainy

### Corresponding Author:

Yasser Ghaleb

## Abstract

**Background:** Urinary tract infections (UTIs) remain a growing public health concern as it may lead to treatment failure and increasing morbidity and mortality. To optimize empirical antibiotic prescription, it is important for clinicians to have a working knowledge regarding UTIs etiological pathogens and its susceptibility patterns.

**Objective:** Determine the prevalence of UTIs, describe their responsible pathogens, and their antimicrobial resistance.

**Methods:** 2015 data on patients attended the Microbiology Department in National Centre for Public Health laboratories (NCPHL) for urine cultures was obtained. UTIs defined as  $\geq 100,000$  CFU/mL of an uropathogen in midstream urine culture. The causative pathogen was identified, and antibiotic resistance carried out by disc-diffusion method.

**Results:** Out of 2901 patients examined, 58% were females and half among 20-40 years age group. The prevalence of UTIs was 34% and more among females: Odds Ratio (OR): 1.8 (1.5-2.0) and elderly  $\geq 60$  years (OR: 1.4 (1.1-1.8)). Gram-negative bacteria constitute 73% of UTI and found to be highly resistance to Nalidixic acid (70%), Co-trimoxazole (64%), and Piperacillin (62%). Gram-positive bacteria that constitutes 27 % found to be highly resistant to Co-trimoxazole (81%), Norfloxacin (69%) and Amoxicillin (67%). *E. coli* was the most common pathogen (42%), followed by coagulase negative Staphylococci (10%) and Klebsiella (8%). While *E. coli* found to be resistant to Co-trimoxazole (66%) and Nalidixic acid (71%), Klebsiella was resistant to Co-trimoxazole (88%) and Nalidixic acid (64%), and Coagulase Negative Staphylococci to Co-trimoxazole (88%) and Amoxicillin (75%).

**Conclusions:** Findings highlight the doubling of UTIs prevalence and growing antibiotics resistance e.g. for Nalidixic acid from 54% to 70% since 2002. Results should guide antibiotic prescribing and developing strategies for controlling resistance. It also underlines the need to establish Antimicrobial Stewardship Program to reduce selection pressure and minimize resistance.

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## Abstract

# Infectious Diseases Surveillance and Notification in Jordan: Physicians' Knowledge, Attitude and Practice

Nansi Abdulrahim; I Alasasfeh; A Abusalieh; I Ablan; Y Khader

### Corresponding Author:

Nansi Abdulrahim

## Abstract

**Background:** Public health surveillance provides crucial information for monitoring the health of the public, identifying public health problems, and triggering action to prevent further illness. Health professionals' knowledge and awareness of the disease surveillance is essential for effective reporting diseases to health departments.

**Objective:** This study aimed to identify the knowledge and attitudes of Jordanian physicians towards public health surveillance.

**Methods:** A cross-sectional study was conducted among resident doctors who were working in four main ministry of health (MOH) hospitals and two teaching hospitals in Jordan in September 2017. Residents from all specialties were visited by the researcher and invited to participate in this study. A self-administered paper-based questionnaire was used to collect the data. The questionnaire collected information about socio-demographic and practice-related characteristics of physicians and included items to assess their knowledge of surveillance and reporting practices.

**Results:** This study included 223 physicians (152 males and 71 females). About 60.1% of the residents were graduates from medical schools in Jordan and the remaining (39.9%) were graduates from medical schools in other countries. Approximately two thirds of residents (62.3%) were doing their residency in MOH hospitals and the rest (37.7%) in two teaching hospitals. Only 44.8% of physicians had defined surveillance correctly. About 53.8% identified population surveys and case reporting as a source of public health surveillance data. Only 27.4% of physicians had been educated or trained on surveillance. About 39.5% of physicians had filled at least one report form during their practice. The main reasons for not reporting mandatory diseases were high workload (49.8%) and being not trained on reporting diseases (46.6%).

**Conclusions:** A relatively high percentage of physicians have insufficient knowledge of surveillance and reporting of notifiable infectious diseases. Training of physicians on surveillance and diseases notification is highly needed. The practice of disease notification should be enforced in Jordanian hospitals.

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Abstract

# Time Series Analysis and Forecasting of Viral Hepatitis A and Typhoid Fever in Lebanon

Nadine Haddad; J Gomes Diaz; A Paez Jimenez; N Ghosn

**Corresponding Author:**

Nadine Haddad

## Abstract

**Background:** In Lebanon, population is described as either regular (Lebanese and Palestinian) or Syrian displaced (since 2013). Along with such population dynamics, two endemic diseases exhibited changes over past years: Viral Hepatitis A (VHA) and Typhoid Fever (TF). During 2008-2015, national annual rates (per 100,000) varied between 7.7-44 for VHA and 6-11.6 for TF.

**Objective:** The following time series analysis (TSA) aim to describe trends and seasonality of each disease and generate predictions.

**Methods:** Cases included in the National database of Epidemiological Surveillance Program of Ministry of Public Health were considered. Descriptive analysis using Excel was performed for each disease for 2008-2015. Weekly and monthly counts were considered for VHA and TF, respectively. Regression models were generated separately for regular and total populations. TSA models for Syrian displaced alone could not be performed as data is available for 3 years only. TSA was performed using Stata v13. Forecasting was generated for 2016.

**Results:** TSA models for VHA and TF show slightly decreasing trends among both regular and total populations. As of 2016W21, average observed weekly VHA rate (per 100,000) is lower than predicted among regular population (0.08 versus 0.13, respectively) and total population (0.04 versus 0.22, respectively). As for TF, observed monthly rates were higher than predicted during 3 first months of 2016 among both regular and total populations.

**Conclusions:** TSA model shows decreasing VHA trend among regular population, despite national outbreak of 2014. As TF also exhibit national decreasing trend, regional analysis can help understand increased monthly TF rates early 2016. Differences between observed and predicted rates should be carefully interpreted with respect to reporting completeness and timeliness, various reporting mechanisms in addition to intervention measures.

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## Abstract

# Laboratory Based Surveillance Using District Health Information System(DHIS2): Lebanon 2017

Dalal Youssef; S Hemedeh; G Allouch; A Yaghi; I Kaysar; A Jouny; F Ghousseini; H Zreik

## Corresponding Author:

Dalal Youssef

## Abstract

**Background:** The Ministry of Health in Lebanon is moving to electronic surveillance using DHIS2. Laboratory-based surveillance is one of the pillars of infectious diseases surveillance.

**Objective:** The main objective is to have real-time information flows in order to timely detect alerts and outbreaks. The existence of multiple surveillance systems for notifiable diseases allows each system to complement the other.

**Methods:** In 2017, DHIS2 tool was used for laboratory surveillance. As part of the implementation process, the online application was developed. Aggregated-based dataset is customized according to the paper reporting form. Accounts users and generic dashboards are generated for each organization unit. Two rounds of trainings were conducted: one in May for initiation and one in July for consolidation. Each round consists of 6 training sessions targeting 150 focal persons working in all public and private hospitals in Lebanon. Then, all hospitals are requested to fill on weekly basis an aggregated based dataset using DHIS2. The dataset includes laboratory general information, bacteriological cultures, stool direct exam, rotavirus testing, serology and influenza testing. Several indicators are generated.

**Results:** After the second-round training, the completeness rate reached 89.5% in October. Highest reporting rates were recorded in South, Nabatyeh and Baalbeck-Hermel (100%). Timeliness reached 73.4%. Positive bacteriological cultures are as follow: Streptococcus (639), Pneumococcus (269), Listeria (4), Meningococcus (11), Haemophilus (292), Vibrio (3, 2 data entry error and 1 Vibrio Cholera non O1 non O139), Brucella (70), Salmonella (538), Shigella (101), E. coli (2664), Campylobacter (46). The cumulative number of protozoa in stool are: Amoebia (8661) and Giardia (1550). 5702 cases of rotavirus were recorded. Serology testing finds 724 hepatitis A, 17 measles and 82 Rubella.

**Conclusions:** After 6 months of implementation of DHIS-2, timeliness and completeness of laboratory reporting are improved. Errors and bureaucratic delays are minimized. Extension of DHIS2 for case-based surveillance is recommended.

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## Abstract

# Recruitment of Cohort Number 20 of Field Epidemiology Training Program — Lessons Learned — Egypt, 2017

Hala Saad; S Elshourbagy; H Abu Elsood; S Refaey; A Kandeel

## Corresponding Author:

Hala Saad

## Abstract

**Background:** The Field Epidemiology Training Program (FETP) had been established in Egypt since 1993. It was the second in the Eastern Mediterranean region. Up to this year, 18 cohorts were graduated from FETP. Approximately 80% of graduates work in the Egyptian ministry of health and population (MOHP) and many fill leadership positions. Others provide essential epidemiological services abroad and to neighboring countries.

**Objective:** We aim to describe and evaluate recruitment process for new FETP residents.

**Methods:** An announcement for recruitment of a new cohort was published on newsletter and on FETP Egypt Facebook page on September 31 for two weeks. Inclusion criteria listed on the announcement based on MoHP requirements. Interested candidates were encouraged to fill an application on FETP Egypt website. The application consists of open ended as well as closed questions. Data were extracted, edit and cleaned using Microsoft Excel. One hundred applicants were short listed and invited by phone call to a Face-to-Face interview. Candidate evaluation was web based, it included measurement of skills, qualifications, and experience using Likert scale.

**Results:** Out 364 responses, 39/346 (11.3%) were replicate applications making 307 total applicants. A total of 269/307 (87.6%) applicants were eligible for FETP requirements. Proportion of females was 176/269 (65.4%). Out of 269 candidates; pharmacists, physicians, dentists and veterinarians were 170 (63.2%), 73 (27.1%), 20 (7.4%), 6 (2.2%) respectively. Out of 100 shortlisted applicants; 87 (87%) responded to the call for the interview. A total of 75 interviewed candidates were placed in various departments of preventive sector; 27 (36.0%) at central level and 48 (64.0%) at directorate level representing 19 governorates. Seven candidates (8.0%) were out of the preventive sector and five (5.7%) were veterinarians serving ministry of agriculture.

**Conclusions:** The online applications made recruitment process ran smoothly; it was much easier and less time consuming. However, open ended questions could be closed.

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## Abstract

# Evaluation of Automated Online Quality Checker Implementation for the Brucellosis Surveillance system, Egypt 2016

Ibrahim ELdeyhy; A Kandeel; A Eid; H Abu Elsood; A El Sabbah

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Ibrahim ELdeyhy

## Abstract

**Background:** National Egyptian Disease Surveillance System collects data on 40 diseases and conditions from 584 nominated reporting sites out of 27 governorates. Brucellosis is a weekly notifiable disease. Reporting levels of completeness and timeliness may differ that may influence data quality; these attributes needed to be assessed prior further manipulation of data. In 2016, Surveillance Online Checker (SOC) was launched to facilitate quality check to give feedback about timeliness and completeness of optional (to online entry) variables to the reporting sites (Completeness of mandatory variables is 100%).

**Objective:** We aimed to measure the effect of Surveillance Online Checker on brucellosis surveillance data completeness and timeliness after one year of implementation.

**Methods:** Brucellosis data completeness and timeliness of selected optional variables from the case reporting form were compared before and after one year (2015-2016) of launching SOC using Chi square and student t-test.

**Results:** It is found that completeness of optional variables were increased from 67.3 % to 78.4% as follows; Detailed Address (67.3% to 78.9%,  $P<0.0001$ ), Patient Telephone (22.1% to 59.9%,  $P<0.0001$ ), National ID (2.8% to 23.8%,  $P<0.0001$ ), Lab Test (81.3% to 86.2%,  $P=0.043$ ) Final Diagnosis (68.3 to 91.8,  $P<0.0001$ ) and Investigation Forms (52.3% to 75.2%,  $P<0.0001$ ). While other variables had no significant change such as Occupation (92.7% to 93.0%,  $P=0.946$ ). The reporting during predefined Timeliness increased from 69.1% to 89.8%,  $P<0.0001$ , with Average Data Entry Time per Case since its classification improved to be 3.8 days instead of 8.8 days. The average time to retrieve previous calculations shortened from 2 working days /month to just seconds after running SOC.

**Conclusions:** Completeness and timeliness of brucellosis surveillance improved after SOC. It is recommended to utilize SOC results by intermediate and peripheral levels after adapting SOC for these levels and adding additional surveillance attributes to SOC.

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## Abstract

# Use of District Health Information System (DHIS-2) for Real Time Surveillance: Lebanon 2017

Dalal Youssef; C Khoury; G Allouch; K Haydar; A Jouny; H Zreik; F Ghoussaini; A Yaghi

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Dalal Youssef

## Abstract

**Background:** The Ministry of Health in Lebanon is in the process of migrating surveillance reporting from a cumbersome paper-based system to a web-based electronic platform (DHIS-2).

**Objective:** The aim of the project is to have real-time information flows in order to timely detect alerts and outbreaks in order to take quickest action.

**Methods:** DHIS-2 tool was initially piloted in Lebanon in 2014 for school-based surveillance. In May 2017, the tool was extended progressively for other surveillance programs collecting aggregate data from hospitals, medical centers, dispensaries and laboratories. As part of the roll-out process, the online application was developed: customized aggregated-based datasets, organization units, accounts users and generic dashboards. 80 training sessions targeting 1290 users were conducted throughout the country. Those trained included 35 district and province health officers, 150 focal persons working in all public and private hospitals, 140 focal persons in laboratories and 800 in medical centers and dispensaries. To assess improvements in surveillance reporting, we compare completeness and timeliness for reporting for the period before and after the implementation of DHIS2. Challenges and lessons learned during the roll-out process are documented.

**Results:** For laboratory-based surveillance, completeness of reporting increased from 70.8% in May to 89.6% in October. Timeliness has improved from 25% to 74%. For medical centers an improvement of 8.1% in the reporting and 9.4% in the timeliness is recorded before and after training sessions. For zero reporting, completeness remains the same (88%) and timeliness has improved from 74% to 87%. There was also increase in the reporting of communicable diseases. Implementation challenges included limited access to internet (29%) and limited workforce (21%).

**Conclusions:** Implementation of DHIS2 resulted improvement in timeliness and completeness for aggregated data reporting. Continued onsite support, monitoring and system enhancement included internet connectivity are needed to enhance the performance of DHIS2.

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## Abstract

# Perception of the Health Surveillance Users on the Health Electronic Surveillance Network (HESN) of Saudi Ministry of Health

Zayid Al Mayahi; F Alswaidi; A Alzahrani

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Zayid Al Mayahi

## Abstract

**Background:** Ministry of health in Saudi Arabia implemented a pioneer electronic health surveillance network in 2012. This advanced system is hoped to play an important role in the prevention and control for possible serious health events and facilitate other public health programs.

**Objective:** To evaluate the perception of active HESN users on its performance as a surveillance system, identify its weaknesses and suggest practical recommendations for improvement.

**Methods:** A complete list of 11324 HESN users was identified. Active user was defined as a user with minimum use of one single time for either immunization or investigation purposes and has a valid email contact. Out of 1535 active users, 700 participants were selected randomly, and a cross sectional study conducted. A pre-designed electronic questionnaire was sent via emails to all the participants. The response rate was (87%), of which the completed forms were 493 (81%).

**Results:** Mean age was  $36.89 \pm 9.11$  (24-66 years), 57.8% were males, and 44.6% participants were Saudis. Riyadh and eastern province represented the highest two regions of participation; 93 (18.9%) and 70 (14.2%) respectively. about half of participants were nurses 251 (50.9%), whereas doctors composed nearly a quarter 123 (24.9%). There were (66.5%) who had experienced surveillance system and (23.9%) worked with electronic medical records. Majority (85.2%) underwent trainings and (92.2%) worked with outbreak investigation function of HESN. About (70.8%) were generally satisfied with HESN, and (41%) believed that HESN requires improvements. Those who use HESN several times a week are more satisfied (81.3%) than one-time users weekly (75.6%) ( $P=0.001$ ). Internet speed has also a significant association with the general satisfaction level about HESN, ( $P<0.001$ ). Users of Google chrome browser are happier (82.3%) than Firefox (78.7%) and Internet explorer users (72%). ( $P<0.001$ ). There are (60.9%) of Arabs and (57.7%) Saudis who agree that HESN needs improvements, compared to only (42.9%) of non-Arabs ( $P<0.001$ ).

**Conclusions:** There is a general reasonable satisfaction level amongst HESN users. However, to ensure achieving the real awaited public health goals of HESN and increase the satisfaction level, there have to be certain and important improvements.

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## Abstract

# Effect of Reminding Parents on Vaccination Dates Using Mobile Short Messages on the Routine Vaccination Coverage of Infants in Al Resafa-Baghdad, 2015-2016

Ashwaq Joodi

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Ashwaq Joodi

## Abstract

**Background:** Vaccination is one of the most successful and cost-effective public health interventions. Public confidence in immunization is critical to sustaining and increasing vaccination coverage rates and preventing the outbreaks of Vaccine Preventable Diseases (VPDs). New innovative methods involving technologies need to be employed to increase the vaccine coverage. Technology use is widespread by patients and providers including text message, email, internet, social media and electronic health records.

**Objective:** To assess the effect of reminding parents on their children's vaccination dates using Short Message System (SMS) on the coverage rates of vaccines in the Primary Healthcare Centers (PHCs) in Baghdad, Iraq, 2015-2016.

**Methods:** An interventional study was conducted in six PHCs that were selected by simple random sampling technique from all PHCs in Resafa side of Baghdad of 4.8 million inhabitants. All Infants aged less than one year who missed any of the vaccines enlisted in the national immunization schedule in these PHCs were considered defaulters and included in the study. In three PHCs, the parents of those children received SMS reminders while the children in the other three PHCs were left for the routine defaulter tracing practices.

**Results:** There were 1299 defaulter children in the six PHCs during the study period; 625 infants were in the intervention PHCs and 674 infants in the non-intervention PHCs. Prior to the intervention, there was no significant difference in the vaccines' coverage between the two groups. After the intervention, the coverage rates among the intervention versus non-intervention groups were: OPV1 (67.1% vs 42.9%;  $P<.001$ ), OPV2 (58% vs 47.1%;  $P<.001$ ), OPV3 (67.4% vs 31.9%;  $P<.001$ ), Penta1 (67.1% vs 42.9%;  $P<.01$ ), Penta2 (67.4% vs 31.9%;  $P<.001$ ), and Measles (69.6% vs 21.6%;  $P<.001$ ), respectively. The average cost per respondent defaulted infant was US \$0.3.

**Conclusions:** The use of SMS in the PHCs to remind parents with defaulters' infants proved effective in improving the vaccination coverage rates.

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Abstract

# Epidemiological Characteristics of Maternal Deaths in Kabul, Afghanistan, 2017

Mahnaz Hamed

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Mahnaz Hamed

## Abstract

**Background:** Each day about 1,000 women die worldwide because of complications related to pregnancy and childbirth. Developing countries account for 99% of the deaths and have the highest maternal mortality ratio (MMR). The vast majority of these deaths would be avoidable if their causes were known and successful interventions implemented. The MMR in Afghanistan has been reduced from 1,300 per 100,000 live births in 1990 to 400 per 100,000 live births in 2016, still among the highest in the world, but the country still needs to reduce the ratio to meet the Millennium Development Goal (MDG) 5 target of 325 deaths per 100,000 live births. We determined the causes of MD in four large maternity hospitals.

**Objective:** To determine epidemiological characteristics of maternal deaths (MD).

**Methods:** A prospective review of all death data among child bearing women was performed in four hospitals from January 1-November 15, 2017. We used the WHO definition of maternal death.

**Results:** Fifty women died and the mean maternal age at death was 31 years. The leading causes of death were hemorrhage (18 women, 58/100,000), hypertensive events (17 women, 56/100,000), thromboembolic events (5 women, 16/100,000), septicemia (5 women, 16/100,000) and cardiac diseases (3 women, 10/100,000). The gestational age was more than 30 weeks in 40 women (80%); 30 women (60%) were prime gravida; deaths occurred among rural mothers in 39 women (78%); 44 women (88%) had no antenatal care; and 26 women (52%) had existing risk factors. The stages of death were during the postpartum period (31 women, 62%), the antepartum period (10 women, 20%), and labor (9 women, 18%). The MMR was 162 /100,000 live births.

**Conclusions:** The MMR was surprisingly low, suggesting Afghanistan can achieve the MDG goal in areas served by reasonable health care. The identification of risk factors will allow us to target specific risk factors with appropriate interventions.

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Abstract

# HIV Status and Use of Contraceptives Among Women of Reproductive Age Group Attending the State Specialist Hospital Akure, 2017: A Comparative Study

Ibidolapo Ijarotimi; O Fawole; A Attahiru; M Shakir; P Nguku

**Corresponding Author:**

Ibidolapo Ijarotimi

## Abstract

**Background:** Globally, in 2015 there were about 17.8 million women living with HIV (WLHA) and about 80% were in their reproductive age and lived in sub-Saharan Africa. WLHA are advised to limit family size and have access to the use of safe and effective contraceptive methods.

**Objective:** We investigated the association between HIV status and contraceptive use.

**Methods:** We conducted a cross-sectional comparative study in which we systematically sampled 500 HIV-positive and 500 HIV-negative women of reproductive age group at the Anti-retroviral and General outpatient clinics of the State Specialist Hospital, Akure. We collected data using interviewer-administered questionnaire. We calculated proportions, odds ratio (OR) and 95% confidence intervals (CI). We conducted multiple logistic regression with level of significance of 5%.

**Results:** A total 469 (93.8%) WLHA and 465 (93%) HIV-negative women responded. Most of the WLHA (192, 40.8%) were in the age-group 35-44 years while most of the HIV-negative women (226, 48.7%) were in the age-group 25-34 years ( $P<0.001$ ). Of the 363 (77.4%) WLHA at risk of getting pregnant, 224 (61.7%) were on contraception. Of the 241 (51.8%) HIV-negative women at risk of getting pregnant, 148 (67.2%) were on contraception. While 365 (77.8%) of WLHA used condoms, only 110 (30.1%) used it consistently and while 232 (49.9%) of HIV-negative women used condoms only 39 (16.6%) used them consistently ( $P=0.008$ ). Though WLHA were 1.61 (CI: 1.24-2.08) times more likely to use any form of contraception than HIV-negative women and 3.53 (CI: 2.65-4.68) times more likely to use condoms than HIV-negative women. HIV status was not a predictor of current contraceptive use (AOR-1.33, CI: 0.68-2.60). The unmet need for contraception among WLHA was 17.1% and 14.8% among negative women ( $P=0.700$ ).

**Conclusions:** The contraceptive prevalence and condom use was low regardless of HIV status. There is need to intensify on interventions that increase contraceptive use among women with particular attention to WLHA.

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Abstract

# Prevalence and Factors Associated with Domestic Violence During Pregnancy in Arua District, Uganda, 2015

Alice Namugamba; R Mangwi

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Alice Namugamba

## Abstract

**Background:** Domestic violence during pregnancy is a serious public health challenge threatening maternal and fetal health outcomes. In Uganda, 16% of women experienced domestic abuse during pregnancy (UDHS 2011).

**Objective:** To investigate the prevalence and factors associated with domestic violence during pregnancy in Arua district so as to identify the magnitude of the problem, inform policy so as to protect pregnant women.

**Methods:** A cross-sectional study was conducted. Multi stage sampling technique was applied. Interviewer administered questionnaires were used. Binary and multi variable logistic regression analyses were carried out to identify strongest factors associated with domestic violence.

**Results:** A total of 459 pregnant women were sampled. Prevalence of domestic violence during pregnancy was 48%. Emotional violence was the most prevalent form of violence (40%) followed by physical abuse contributing 29% and sexual violence 28%. Pregnant women reported husbands as their most perpetrators. Partner's alcohol consumption was the strongest risk factor associated with domestic violence during pregnancy (AOR 12.20 CI 2.25-65.92) followed by number of wives (AOR 2.16 C.I 1.08-4.32), wanting to be pregnant (AOR 0.26 C.I 0.14-0.48) and occupation too (AOR 2.22 C.I 1.12-4.42).

**Conclusions:** Domestic violence against pregnant women was quite high. Almost five in ten women experienced domestic violence. Partner's alcohol consumption and number of wives were the strongest factors. Partner involvement during antenatal period is important. Increased attention to this vulnerable group is needed to improve maternal and child health. Antenatal care is known to be an important window of opportunity in providing support.

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Abstract

# Rate and Causes of Cesarean Section in North of Jordan

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Alaa HamdAllah**Corresponding Author:**

Alaa HamdAllah

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**Abstract**

**Background:** WHO recommends that the rate of cesarean section (CS) should not exceed 10-15% in any country. In recent years, the rate of cesarean deliveries increased dramatically worldwide with many countries had exceeded the WHO recommended rate. One study in Jordanian University Teaching hospitals showed that the rate of CS increased from 18.2% in 2002 to 30.3% in 2012.

**Objective:** Determine the rate and causes of cesarean deliveries in north of Jordan.

**Methods:** A prospective hospital-based longitudinal study was conducted. Women were enrolled in the study after delivery. All women who gave birth (dead or alive) at 20 weeks of gestation or more in four selected hospitals were eligible for inclusion. Necessary data for mothers were gathered through face-to-face interview using a semi-structured questionnaire and by abstraction of data from medical records. Information on causes of CS were confirmed by physicians.

**Results:** The overall rate of CS was 37.5% (16.3% for emergency CS and 21.2% for planned CS) among Jordanian women. The rate of CS varied significantly according to health sector. The most frequent reason for planned CS was scarred uterus (50.0%). The second most common reason was multiple fetuses (20.8%). The most frequent reasons for emergency CS were prolonged fetal distress (33.5%) followed by obstructed labor (22.2%), abnormal presentation (13.1%), and eclampsia or sudden severe high blood pressure or seizure (6.3%).

**Conclusions:** Jordan has a markedly high rate of CS. The rate of planned CS is higher than that of emergency CS. Scarred uterus and multiple fetuses are the most common reasons for planned CS. A multidisciplinary quality assurance program should be established in all Jordanian facilities in which delivery occurs.

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## Abstract

# Current Practices of Contraceptive Use Among Palestine Refugee Mothers of Young Children Attending UNRWA Clinics, A Follow Up Study 2015

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Majed Hababeh

### Corresponding Author:

Majed Hababeh

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## Abstract

**Background:** UNRWA introduced family planning services in 1994 as an integral part of its expanded maternal and child health care program. The main objective of UNRWA's family planning program is to promote the health of mothers, children and subsequently their families.

**Objective:** The ultimate objective of this follow-up study was to assess the current situation regarding contraceptive practices among the target population after five years from the 2010 follow-up study and to identify future program needs leading to the development of action-oriented activities.

**Methods:** A cross-sectional survey was conducted by trained nurses from June - December 2015. Participants were Palestine refugee mothers who attended well-baby clinics with their youngest child (aged 2 months through 5 years) at all UNRWA health centers. A sample size of 10478 participants was calculated based on contraceptive use prevalence in 2010, using Epi Info sample size calculation. Mothers were interviewed and retrospective data from health records was used as supplement. All participants provided verbal informed consent. The study protocol approved and cleared by UNRWA health department ethical committee. A multiple logistic regression was performed to test if maternal age and parity predicted contraceptive use. Chi-square was used to analyze the relationship between previous contraceptive use and birth interval, birth weight, and gestational age.

**Results:** Data was obtained from 9860 mothers, with a mean age of 29.8 years. Of them, 59.3% were using modern contraceptives at the time of the survey, 17.7% were using traditional methods, and 23.0% were not using any contraceptive method. The most common modern contraceptive was intrauterine device (37.4%), and UNRWA was the main provider for 82.6% of women currently using modern contraceptives. The most common reasons for not using contraceptives were child wish (21.7%), pregnancy (18.6%) and husband opposition (19.7%). Using women with <3 pregnancies as the reference category, women with 3-6 pregnancies are significantly more likely to use contraceptives ( $P<0.001$ ; OR 1.58 [CI 1.43  $\pm$  1.73]), as are women with >6 pregnancies ( $P<0.001$ ; OR 1.6, [CI 1.28  $\pm$  1.99]). Women with at least 1 male child are significantly more likely to use contraceptives ( $P<0.001$ ; OR 1.39 [CI 1.24  $\pm$  1.56]). Maternal age over 35 was not a significant predictor for modern contraceptive use. Chi-square used to test the association of modern contraceptive use prior to pregnancy with birth weight, the result showed statistically significant 23.88 ( $P<0.001$ ) while gestational age was not a significant in the child born of that pregnancy.

**Conclusions:** It is encouraging that mothers seeking modern contraceptives rely on UNRWA to provide family planning services. We found that mothers with higher parity are more likely to use modern contraceptives, which comply with UNRWA recommendations. As expected, modern contraceptives lead to better birth spacing. However, mothers above 35 years of age are not more likely to use modern contraceptives. These mothers may be at higher risk for negative maternal and infant health outcomes. UNRWA family planning services could focus more on counseling this group of mothers.

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Abstract

# Palestinian Women Reproductive Health Rights: Knowledge, Opportunities, Challenges and the Way Forward. A Qualitative Study in Bethlehem Area in the West Bank

Yara Hadweh

**Corresponding Author:**

Yara Hadweh

## *Abstract*

**Background:** Reproductive health rights (RHR) were declared as fundamental human rights since Cairo's (1994) and Beijing's (1995) conferences. The acknowledgement of the importance of these rights was a momentous point for reproductive health. In the Palestinian context, RHR are severely affected by the combination of constraints of the political system and the cultural context. RHR remain one of the least prioritized matters making them extremely unmentionable.

**Objective:** To underpin the multiple political-demographic and cultural factors/conditions that influence Palestinian women RHR.

**Methods:** This research relied on an empirical qualitative study. Semi-structured interviews were done through Skype. A purposive sample of ten Palestinian women living in Bethlehem Area in the West Bank was selected. These interviews formed the basis of the analysis.

**Results:** Findings were considered under five emergent themes: knowledge, information and education; services and resources; Palestinian context and norms; conflict and occupation; violence against women. These intersecting themes shaped women's knowledge and perceptions of RHR. They highlighted the underpinning factors that influence the existing opportunities and challenges for Palestinian women to access to RHR, and health seeking behaviors and overall wellbeing.

**Conclusions:** This research emphasizes the great importance of this topic to the field of public health in general and specifically women's health. This research is rare in its kind in the Palestinian context. In insuring universal access to RHR in Palestine, it is recommended that governments should demonstrate commitment to prioritizing RHR initiatives. Creating economic opportunities and socio-cultural empowerment for women in Palestine would build women's resilience. Further researches regarding RHR should be conducted in other areas of Palestine.

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## Abstract

# Risk Factors and Causes of Neonatal Mortality at Al Hoceima Provincial Hospital (Morocco), 2016

Mouad Merabet; A Idrissi; M Maassoumi; G Bukassa; H Tahri; S Sedrati

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Mouad Merabet

## Abstract

**Background:** In Morocco, the neonatal mortality rate is 21.7 / 1000 live births, which represents three quarters of the deaths of children under one year old. In 2015, 3.6% of intra-hospital neonatal deaths in Morocco were recorded in the province of Al Hoceima

**Objective:** The objective is to describe neonatal deaths and identify their risk factors at the Al Hoceima Provincial Hospital.

**Methods:** This is a retrospective case-control study at the neonatal unit of the Al Hoceima Provincial Hospital. The cases were the total of neonatal deaths in 2016. One control for each case was chosen randomly from the newborns admitted to the neonatology unit and taken out alive. The analysis of the data was carried out by Epi-Info 7.

**Results:** The total number of newborns who died in 2016 was 81, with an intra-hospital neonatal mortality rate of 22.85 / 1000 live intra-hospital births. 88.89% of deaths occurred in the early period and 37.04% occurred in less than 24 hours. The main causes were prematurity (39.51%), respiratory distress (19.75%), and congenital malformations (14.81%). 6 factors significantly associated with neonatal death in multivariate analysis. 3 factors were poor prognosis: pregnancy at risk (OR adjusted = 9.70 [3.42, 27.50] 95% CI), birth weight <2500g (OR adjusted = 4.74 [1.88, 11.93] 95% CI), Apgar score at birth <7 (OR adjusted = 4.28 [1.62, 11.34] 95% CI). And 3 factors were of good prognosis (OR adjusted = 0.07 [0.02, 0.27] 95% CI), hospital delivery (OR adjusted = 0.09 [0.03, 0.29] 95% CI), pregnancy followed in prenatal consultation (OR adjusted = 0.06, 0.45] 95% CI).

**Conclusions:** Neonatal mortality in the Al Hoceima hospital remains high and is mainly related to the course of pregnancy and childbirth as well as the characteristics of the newborn at birth. To this end, pregnancy monitoring, confinement in a supervised environment and integrated management of the mother-to-newborn couple are the key measures to reduce this real health problem.

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## Abstract

# Worse or Just Different? Self-reported Sleep Characteristics of Pregnant and Non-Pregnant Women in the UK Household Longitudinal Study

Nora Alaif

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Nora Alaif

## Abstract

**Background:** The American Academy of Sleep Medicine include pregnancy-associated sleep disorder (PASD) in its International Classification of Sleep Disorders. PASD is indicated by: either frequent arousals and reduced sleep efficiency or a prolonged habitual sleep duration; and habitual sleep latencies of <10 min.

**Objective:** The present study aimed to assess whether pregnant women sleep differently to non-pregnant women, and if so whether any differences might reflect underlying PASD.

**Methods:** Methods Data on self-reported sleep characteristics (duration [hours]; latency, disturbance, coughing/snoring, medication and daytime sleepiness [frequency]; and quality [very good, fairly good, fairly bad, very bad]) from Waves 1 and 4 of the UK Household Longitudinal Study were available for n=792 pregnant and n=9,965 age-matched non-pregnant women with complete data on seven potential confounders (age, ethnicity, educational, marital status, employment, parity and household structure). Multinomial logistic regression analyses were conducted before and after adjustment for confounding using STATA IC14 using the least unfavorable response as the referent category.

**Results:** Pregnant women were more likely to sleep both shorter and longer than 7-9 hrs (RRR = 1.22-1.45), and they were also more likely to struggle to get to sleep within 30 min on a regular basis (RRR = 1.07-1.28). Although pregnant women reported more frequent sleep disturbance than non-pregnant women (RRR = 1.35-3.72), they did not report coughing/snoring more frequently (RRR = 0.89-1.20). Likewise, despite reporting poorer sleep quality than non-pregnant women (RRR = 1.60-2.21), pregnant women were less likely to report using sleep medication on a regular basis (RRR = 0.44-0.55). Finally, pregnant women were more likely to report difficulty staying awake during the day than non-pregnant (RRR = 1.28-1.77).

**Conclusions:** The findings of the present study confirm that pregnant women sleep differently to non-pregnant women, although these differences may partly reflect the lower use of medication by pregnant women.

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## Abstract

# Risk Factors for Preterm Birth in Morocco, 2017

Fadoua Oudrhiri; A Barkat; A Khattabi; B Assarag

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Fadoua Oudrhiri

## Abstract

**Background:** Preterm birth (PTB) is a delivery that occurs before 37 weeks of gestation. It is the leading cause of newborn deaths in Morocco and worldwide.

**Objective:** The aims of our study were to identify the main risk factors of PTB and to propose measures to prevent and improve its management in our context.

**Methods:** We conducted case-control study in intensive care unit of neonatal medical service in Rabat university hospital considered as the inter-regional hospital. We included 87 preterm births before 37 gestations weeks and 174 term-controls. Data about the women's obstetrical and gynecological history, pregnancy complications and behavior during pregnancy was obtained using a structured questionnaire and medical records. The data was analyzed using SPSS version 20. The logistic regression was employed to identify risk factors of preterm birth.

**Results:** The PTB incidence was 10.92%, The major factors leading to preterm labor were: herbal medicine use during pregnancy (OR adjusted 20.23, CI 5.39-75.8); Short interpregnancy intervals (OR adjusted 14.62, CI 2.75-77.5), history of preterm delivery (OR adjusted 9.51, CI 1.54-58.6); taking medicine during pregnancy (OR adjusted 2.40, CI 0.98-5.91), history of uterine curettage (OR adjusted 7.97, CI 1.63-38.8), having a twin pregnancy (OR adjusted 8.57, CI 1.95-37.7), maternal age less than 20 years old (OR adjusted 8.32, CI 1.59-43.5); primiparity (OR adjusted 7.31, CI 1.26-42.3); urogenital tract infection (OR adjusted 6.63, CI 2.37-18.4) and insufficient monitoring of pregnancy (OR adjusted 2.78, CI 1.04-7.40).

**Conclusions:** Mortality rates of newborn could be reduced if the incidence of prematurity decreases. Therefore, we should improve the prenatal care, the screening and early detection of pregnancies at risk for preterm birth, the screening of urogenital infections. Young women should be aware of risk behaviors during pregnancy.

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Abstract

# Risk Factors of Preterm Newborns in Al-Zahraa Hospital /Al Najaf Al Ashraf Province, Iraq 2017

Abdul Wahhab Jewad

**Corresponding Author:**

Abdul Wahhab Jewad

## Abstract

**Background:** Preterm is a major determinant of infant mortality and morbidity. It is generally recognized that the etiology of preterm is multifactorial. In Iraq the preterm birth rate in 2010 is generally 6, 5% and deaths due to preterm birth 9%.

**Objective:** To determine the risk factors of preterm new-borns in Al Zahra Hospital.

**Methods:** A case control study was conducted Between December 2016 - February 2017 in Al Zahra hospital. All preterm newborns and double number of healthy controls were included in this study. Basic demographics and epidemiological data gathered from all cases and controls by direct interviewing the mothers of newborns, to identify potential risk factors. To assess the strength of association the odds ratio and 95% confidence interval of odds ratio was calculated.

**Results:** The total number of cases was 97, about 62 (64%) of cases were females. Majority of mothers 40 (41%) were at age group 25-34 years and about 30 (41%) of mothers had incomplete antenatal visits. Significant risk factors identified during analysis included female gender [OR=2.31 (1.34-3.99)], Rh incompatibility [OR=3.04(1.33-6.91)], inadequate antenatal care [OR=2 (1.13-3.55)], antepartum hemorrhage [OR=3.37(1.60-6.95)], illiterate mothers [OR=1.87 (1.01-3.43)], History of LBW [OR=11.1(5.46-22.57)], rural residency [OR=2.31(1.34-3.99)], history of abortion [OR=2.50 (1.47-4.25)], birth interval< 2 years [OR=1.77(1.01-2.99)], and extended family [OR=2.08(1.18-3.76)]

**Conclusions:** Many risks for preterm newborn can be identified before pregnancy occurs. Health education, socio-economic development, and increasing the use of health services during pregnancy were recommended.

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Abstract

# Diabetes in Jordan: Prevalence, Trend, Awareness and Control

Fatima Zerriouh; Y Khader

**Corresponding Author:**

Fatima Zerriouh

## Abstract

**Background:** Studies have reported an increasing prevalence of type 2 diabetes Mellitus (DM), with the most dramatic increase occurring in developing countries.

**Objective:** This study aimed to determine the prevalence of type 2 DM and impaired fasting glycemia (IFG), assess the trend, awareness and state of control of type 2 DM in Jordan.

**Methods:** Data were analyzed from a cross-sectional study in 2017 that included a random sample of 4056 Jordanians aged 25 years and above. DM and IFG were diagnosed according to American Diabetes Association definition. HbA1c >7.5% was defined as unsatisfactory metabolic control.

**Results:** This study included a total of 4056 persons (70.5% females). The age-standardized prevalence rate of IFG was 21.6% among males and 19.2% among females and that for DM was 28.3% (95% CI: 25.5, 31.1) among males and 19.9% (95% CI: 18.1, 21.6) among females. The prevalence rate of DM increased significantly with increasing age peaking at age of 60-64 for both males (58.7%) and females (53.1%). In consecutive surveys (1994, 2004, 2007, and 2017) that adopted the same methodology, the aged-standardized rate of DM increased from 13% in 1994 to 17.1 in 2004 to 13.4 in 2007 to 22.3 in 2017. Of the 888 diabetic subjects, 768 (86.5%) had been previously diagnosed and 13.5% were diagnosed by the study team. Of the 768 patients who were previously diagnosed, 699 (91.0%) were on treatment; of whom 212 (30.0%) had good glycemic control.

**Conclusions:** The prevalence of type 2 diabetes and IFG is high in Jordan and is increasing. More than two thirds of patients had diabetes with unsatisfactory control. Therefore, they are likely to benefit from programs aimed at encouraging behaviors toward achieving optimum weight as well as physical activity behaviors. Physicians caring for patients with diabetes may need to adopt a more vigorous approach for diabetes control.

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Abstract

# Malnutrition Among Under Five Children in Iraq, 2002 - 2016

Hasanein Malik; F Lami

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Hasanein Malik

## Abstract

**Background:** In Iraq, the long-standing war and civil unrest had negatively affected food security, water quality, sanitation and environmental conditions that contributed to decline in the nutritional and health status of children.

**Objective:** The objective of this study is to assess the trend of different types of malnutrition among <5years children in Iraq, 2002-2016.

**Methods:** We used data from four Multiple Indicator Cluster Surveys (MICS 2, 3, 4 and 5). Three WHO malnutrition indicators were assessed: stunted growth (z-score of height for age= -2.01), underweight (z-score of weight for age=-2.01) and wasting (z-score of weight for height= -2.01).

**Results:** The prevalence of stunting decreased from 24.2% in 2002 to 16.6% in 2016. Severe stunting was 8.7% in 2002 and 6.7% in 2016. Male: female ratio was 1:1 in 2002 and 1:1.3 in 2016. The highest prevalence was among children aged 12-23 months in 2002 (28.9%) and among those aged 48-59 months (30.1%) in 2016. The prevalence of underweight decreased from 16.9% in 2002 to 5.9% in 2016. Severe underweight was 2.7% in 2002 and 1.7% in 2016. Male: female ratio was 1.1:1 in 2002 and 1.4:1 in 2016. The highest prevalence was among children aged 12-23 months in 2002 (24.4%), while in 2016, it was among children aged 0-11 months (24.8%). The prevalence of wasting had slightly increased from 7.3% in 2002 to 7.8% in 2016. Male: female ratio was 1.2:1 in 2002 and 1.3:1 in 2016. The highest prevalence was among children aged 12-23 months in 2002 (10.0%), while in 2016, it was among children aged 0-11 months (13.0%).

**Conclusions:** In spite of the tremendous challenges that faced Iraq during 2002-2016, the decline in the prevalence of stunting and underweight reflects better-provided health services. All types of malnutrition are still there and intensified multidisciplinary efforts are recommended.

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## Abstract

# Impact of the 2015 Yemeni War on the Under One Year Children Immunization Coverage

Amr Torbosh; M Alemad

### Corresponding Author:

Amr Torbosh

## Abstract

**Background:** After two-years of the war that have crippled the capacity of the Yemeni National Health System and left only 45% of health facilities are functioning, Yemen faced increasing vaccine preventable diseases (VPD) outbreaks and may become at high risk of polio importation.

**Objective:** To document the impact of the 2015 war on under one-year Yemeni children immunization coverage.

**Methods:** Data on vaccination coverage for the 2012-2015 was obtained from the National Expand Program for Immunization (EPI). The vaccination coverage was calculated at national and governorate levels through dividing the number of the actually vaccinated children by the estimated under one-year children population.

**Results:** Although there is an increase from 2012 to 2014 in the national coverage with Penta 3 (82 vs. 88%) and measles (70% vs. 75% respectively), the coverage was still below the national target (= 90%). Furthermore, the 2015 witnessed marked drop in national coverage compared to 2014 for measles (66% vs. 75%) and BCG (49% vs. 73%) but slight drop in coverage by Penta 3 (84% vs. 88%). Such drop was more marked at the governorates that witness armed confrontations e.g. Taiz governorate showed drop in Penta 3 coverage from 93% in 2014 to 73% in 2015 and Sa'dah from 50% to 38%. On the other sides, governorates that did not witness armed confirmations showed increase in coverage e.g. Rima showed increase in Penta 3 coverage from 87% to 106% for the same period.

**Conclusions:** The analysis shows the marked negative impact of the 2015 war on immunization coverage especially in the governorates that witness armed confrontations that may put Yemen at more risk for polio importation and VPD outbreaks. Besides the ongoing struggles to stop the Yemeni war, more innovative vaccine delivery/provision and increasing demands strategies are needed especially in governorates with confrontations.

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## Abstract

# Determinants of Cervical Cancer Screening in Tunisia: A Cross Sectional Study Among 1494 Women Aged Between 18 and 65 Years of Age

Hejer Letaief; A Hechaichi; S Chelly; H Bouguerra; S Rejaibi; F Saffar; A Cherif; M Chahed

## Corresponding Author:

Hejer Letaief

## Abstract

**Background:** In low- and middle-income countries, cytology-based programs are very difficult to implement, and where they are implemented, the screening coverage is low. Routine screening of cervical cytology has been implemented in Tunisia in order to decrease cervical cancer incidence and mortality. Understanding the factors associated with cervical cancer screening among target populations is important to improve the screening participation rate. In Tunisia, few studies have examined cancer screening among women in relation to socio demographic and socioeconomic status.

**Objective:** To estimate the coverage of women by cervical cancer testing and to assess the relation with sociodemographic and socioeconomic determinants.

**Methods:** A cross-sectional survey was conducted in 2014 and face-to-face interview questionnaires were completed by a sample of 1494 women aged 18 years and older.

**Results:** Only 36.6% (95% CI 34.3%-39.2%) of 1494 women aged 18 years had received a previous cervical screening test. This rate increased significantly ( $P < 10^{-3}$ ) with age from 13.9% for those aged less than 30 years to 29.1% for those aged between 30 and 40 years, to 47.9% for women aged 40-50 years old and 49.3% for those aged more than 50 years. In multivariate, we found previous cervical cancer screening was significantly associated with household income, occupation, level of education, tobacco use, medical previous history and familial history of cancer, at risk sexual behavior and history of sexual transmitted diseases.

**Conclusions:** The coverage of women population with cervical cancer screening was found to be very poor. Analyses of cancer screening rates by measures of income, educational level, and other factors may help to implement a comprehensive, integrated approach across different health programs. Given the importance of knowledge in encouraging women to participate in screening is key to reducing cervical cancer burden in Tunisia. A health promotion intervention should be developed and implemented in project counties focusing on improving their knowledge.

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## Abstract

# Fatal Domestic Injuries in Iraq, 2010-2015

Khitam Ali; A Raddi; F Lami

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Khitam Ali

## Abstract

**Background:** Home injuries are leading causes of death and disability worldwide. About 5.8 million people die from injuries each year around the world. This accounts for 9% of the world's deaths. About one third of all injuries happen at home.

**Objective:** This study was conducted to describe the epidemiological characteristics, estimate incidence and identify mechanism of fatal domestic injuries (FDI), Iraq, 2010-2015.

**Methods:** We conducted this cross-sectional study on all fatalities due to injuries reported from all the coroner offices in Iraq for the period of 2010-2015 as part of Iraqi Injury Surveillance System. The surveillance form included detailed data on the demographics, injury circumstances and injury mechanisms. National and governorates population data were obtained from Ministry of Planning.

**Results:** Total number of FDI during 2010-2015 was 17,211 with an average annual incidence of 11/100,000Population (P). FDI represented 24.5% of total fatal injuries. The incidence of FDI decreased from 11.6/100,000P in 2010 to 10.2/100,000P in 2015. Female to male ratio was 1.1:1 and 38.8% occurred at the age group 20-39 years. The highest incidence 27.5/100,000P was recorded at the age group=70 years. About 71.5% were unintentional with average annual incidence 7.7 /100,000P and the remaining were intentional with average annual incidence of 1.6/100,000P. About 61% of FDI occurred during 7am-4pm. Main causes of FDI were: Burn (44.5%), electric injury (21.8%), gun fire (7.8%), and fall (4.9%) with average annual incidence rate of 4.9, 2.3, 0.8, and 0.4 per 100,000P, respectively. The highest average incidence was reported in Misan (19.4/100,000P), and Erbil (16.6/100,000P) governorates, while the lowest was reported in Najaf (3.4/100,000P) governorate.

**Conclusions:** In Iraq, FDI constituted a considerable public health problem. Public Health officials need to develop a comprehensive program to control home injuries particularly burn and electrical injuries and ensure that people have safe and healthy homes.

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## Abstract

# Prevalence and Risk Factors for Early Childhood Caries in Children Less Than 6 Years Old: A Systematic Review

Reham Kamel; S Refaey; H Abu El-Sood; A Mohsen

## Corresponding Author:

Reham Kamel

## Abstract

**Background:** Early childhood caries (ECC) is a very common multifactorial bacterial infection. It negatively impacts children's psychological status and quality of life. Therefore, the World Health Organization (WHO) global oral health goals for 2000 were established stating that 50% of 5-6-year olds would be free of dental caries.

**Objective:** To describe ECC prevalence and severity among children less than 6 years old in Egypt and compare it with other countries in other regions, to investigate risk factors associated with ECC, and to determine areas for future research.

**Methods:** The search included published studies of any design in PubMed database, and Google scholar with the key words dental caries, prevalence, children, childhood, risk factors. The inclusion criteria required that selected children should have deciduous dentition and the method used for caries assessment should be either decayed, missed/extracted, or filled tooth index, or decayed, missing, and filled surface index for children less than 6 years old.

**Results:** The search identified initially 300 articles of which 22 studies published between 2001 and 2017 were included in the review (19 cross sectional, two case control and one interventional). The prevalence of ECC in the reviewed studies ranged widely (16% - 89%). The median prevalence was highest 76% (IQR: 72.5%, 82.5%) in the Middle East Region followed by Asia which was 48.3% (IQR: 32%, 52%) while it was observed to be the least (20.7% - 24.9%) in developed countries. However, in Egypt, it was 66.8% (IQR: 63%, 71%). Some factors were statistically significant with ECC development as age (6 out of 11 studies), parental education and sugar intake (5 out of 6 studies) while gender was not statistically significant (11 out of 14 studies).

**Conclusions:** WHO global target is still far away in Egypt. Enhancing community oral health programs is necessitated to address the gaps and leading initiatives of preventive actions.

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## Abstract

# Cost of Diabetes in Saudi Arabia

Mohammad AlMazroa

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## Abstract

**Background:** The Kingdom of Saudi Arabia (KSA) has made tremendous improvements in its health system in a short period of time due to extensive investments from oil revenues. In 2015, the Saudi Ministry of Health (MOH) housed 250,000 personnel, including 31,516 physicians and 75,978 nurses, and operated 249 hospitals with 34,000 beds. It is responsible for 60% of healthcare services, with the remaining 40% managed by a number of semi-public organizations and the private sector. The MOH is in charge of health promotion, disease prevention, and treatment. Health care services are provided for free throughout the country. In recent years and with improvements in infrastructure and health services, an increasing burden of non-communicable diseases is emerging. We recently reported high rates of diabetes mellitus.

**Objective:** Diabetes mellitus is a major burden in the Kingdom of Saudi Arabia (KSA). We estimated the direct cost of diabetes in KSA and the future cost accounting for currently undiagnosed and borderline diabetics. **Methods:** We used a bottom-up approach to determine the direct cost of diabetes mellitus in KSA at the population level using Saudi Ministry of Health (MOH) cost data for medications, health visits, laboratories, and hospitals.

**Methods:** KSA MOH, developed a database of available published and unpublished data sources to generate the burden of disease for KSA. Key inputs into this database included systematic reviews of the literature, analysis of household survey data, antenatal clinic surveillance, reportable disease notifications, disease registries, hospital admissions data, outpatient visit data, population-based cancer registries, active screening data, and other administrative data. Moreover, the MOH provided detailed data on the prices of medications, laboratory testing, medical procedures, and clinic and hospital visits and stays. We assumed that the MOH cost estimates apply to the population served by the private sector and other governmental health agencies such as the armed forces or the National Guard. Blood samples were collected at local health clinics and analyzed in a central lab at the King Fahd Medical City in Riyadh. COBAS INTEGRA400 plus was used to measure blood levels of HbA1c, or glycated hemoglobin. A Roche Hitachi COBAS 8000 system was used to measure cholesterol. Respondents were considered to be diabetic if they met any of the following criteria: 1) measured HbA1c equals or exceeds 6.5% (48.5 mmol/mol), or 2) measured HbA1c does not equal or exceed 6.5% (48.5 mmol/mol), but the respondent reported taking medications for diabetes. Respondents were considered to be have borderline diabetes (glucose intolerant) if: 1) they did not report taking drugs for diabetes, and 2) their measured HbA1c blood level was greater than 5.7% (35.3 mmol/mol) and less than 6.5% (48.5 mmol/mol). Women were asked if they were diagnosed with diabetes during pregnancy. Respondents were considered hypercholesterolemic if they met any of the following criteria: (1) measured cholesterol equal to or exceeding 6.2 mmol/L or measured cholesterol not exceeding 6.2 mmol/L, but the respondent reported taking medications for hypercholesterolemia.

**Results:** Overall, 1,095,776 (8.5%) Saudis reported being diagnosed with diabetes. However, a total of 1,745,532 (13.4%) Saudis aged 15 years or older had diabetes. This total group is the sum of measured diabetes (1,193,075, 68.4%) and those who were currently on diabetes medication with controlled levels of HbA1c (552,457, 31.6%). Among those that our survey identified as diabetic from blood tests, 43.6% were undiagnosed. Moreover, 15.2% of Saudis, or 979,953, had borderline diabetes. the total cost of diabetes in KSA. The cost currently is at 17 billion Riyals. If those who are undiagnosed joined the treatment pool, the cost would increase to 27 billion Riyals. If those with glucose intolerance (pre-diabetes) progressed at the current observed rate, the total cost would be 43 billion Riyals.

**Conclusions:** Our study calls for immediate action to reduce the burden of diabetes and non-communicable diseases (NCD). A national plan to prevent and control the rising burden of chronic diseases should be developed and implemented. We previously reported that Saudis do not seek preventive care. Hence, it is crucial that the programs involve community engagement and early screening. Campaigns to educate the public about the disease should be a priority. The campaigns should include information on the risk factors for diabetes and gestational diabetes. the total cost of diabetes in KSA. The cost currently is at 17 billion Riyals.

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Abstract

# Knowledge, Attitude and Practice of Breast Self-Examination Among Females Governmental School Teachers in Bethlehem District - Palestine, 2015

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Liana Haddad**Corresponding Author:**

Liana Haddad

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**Abstract**

**Background:** Breast Self-Examination (BSE) is an important public health screening principle. It is a no cost and easy process whereby women examine their breasts regularly to detect any abnormal swelling or lumps in order to seek if needed a medical aid. According to Palestinian Ministry of Health Annual Report 2014, breast cancer is the first cause of female death among the other cancer causes and most of the cases had been discovered at late and sever stages and 58.9% of them are (15 - 64 years). Bethlehem district stays in the third place among the other districts with cancer incidence rate 111.2 per 100,000 of population (103,550 Females, 106,934 Males).

**Objective:** The aim of the study is to evaluate the level of knowledge and practice of BSE among female governmental school teachers in Bethlehem District.

**Methods:** A cross sectional study using a structured, self-completed and pre-tested questionnaire designed by the researcher has been used in 2015 in seven schools that randomly selected. A written informed consent from the participant and permission from the minister of education was obtained.

**Results:** From what is shown, the majority of the teachers were aware of BSE with percentage 97,3% and 76,9% of them only knew the procedures of BSE and actually 47,6% of them do not make BSE periodically. The study also showed that 57.1% of the respondents knew about the breast cancer from the media, followed by 25, 2% from health workers; in addition, the study revealed 77.6% are aware about the symptoms of breast cancer, while 81.6% showed that is BSE is not enough to diagnose breast cancer.

**Conclusions:** Awareness of BSE was high, but the practice was low. It is recommended that public awareness of the importance of BSE be intensified using mass media. And health worker should promote BSE during their contact with clients.

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## Abstract

# Estimation of Heavy Metals in Branded and Local Snacks in the Markets of Peshawar, Khyber Pakhtunkhwa, Pakistan

Kashif Ur Rehman Khalil; N Mehsood; M Faisal

## Corresponding Author:

Kashif Ur Rehman Khalil

## Abstract

**Background:** Heavy metals in food is emerging public health problem. They are defined as elements that have high atomic weight as compared to water and a minimum density of 5 times greater than that of water. They are of concern because of their adverse effects on individual health.

**Objective:** To estimate the concentration of heavy metals (Lead, cadmium, Chromium and copper) in branded and non-branded (local) snacks in the markets of Peshawar, Khyber Pakhtunkhwa, Pakistan.

**Methods:** A total of 96 different samples of potato and corn snacks were selected from four towns of district Peshawar by convenient sampling technique. All samples were subjected to wet digestion using acid digestion technique and Lead, Cadmium, Chromium and copper were quantitatively detected, using Atomic Absorption spectrometer in the Public Health laboratory Khyber Medical College Peshawar.

**Results:** Mean concentration of Lead, cadmium, chromium and copper in potato based branded snacks were in the range of 0.085-0.423mg/kg, 0.003-0.046 mg/kg, 2.186-2.328 mg/kg and 0.008-0.108 mg/kg and concentration of heavy metals in corn based branded snacks were in range of 0.240-0.351 mg/kg, 0.007-0.012mg/kg, 2.254-2.179 mg/kg, 0.030-0.082 mg/kg, respectively. While mean concentration of Lead, cadmium, chromium and copper in non-branded (local) snacks were 0.057-0.324 mg/kg, 0.005-0.012 mg/kg, 2.137-2.247 mg/kg and 0.018-0.06 mg/kg, respectively.

**Conclusions:** Chromium were exceeding in majority samples of branded and local snacks.

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Abstract

# Use of Mobile Phone During Driving and the Risk of Collision Among Preparatory Year Students in King Saud University, Riyadh, 2014

Fahad Al-Jasser; A Gad Mohamed; A Choudhry; R Youssef

**Corresponding Author:**

Fahad Al-Jasser

## Abstract

**Background:** Mobile use while driving is a major cause of road traffic injuries.

**Objective:** To determine the rate of mobile use while driving among King Saud University students, their perception of the risks and its contribution to collisions.

**Methods:** A cross-sectional study was conducted in May 2014 targeting 986 male students of King Saud University. A questionnaire was used to obtain data on possessing a driving license, years of driving, driving hours, and collision or near collision in the six months preceding the study. Eight statements were used to assess the behavior and perceptions related to the use of mobile phones while driving. Data were analyzed using the chi-square statistic, odds ratio (OR) and the 95% confidence interval (95% CI).

**Results:** Half the participants (45.3%) have a driving experience of 4-6 years and 18.3% of them did not have a driving license. Collision in the preceding six months was reported by 44.6% of participants and 37.9% of them attributed their occurrence to mobile phones. Variable proportions reported always texting (53.3%) or talking in hand-held (66.2%) or hand-free (26.1%) phones while driving. A significantly higher risk of collision was observed among participants who reported always talking on mobile phones while driving as hand-held (OR 1.435) and hand-free (OR 1.469) as well as sending or receiving text messages (OR 1.885). The risk increased significantly from 2.052 among participants who reported driving daily for 1-2 hours to 3.165 among those who reported driving for more than 6 hours.

**Conclusions:** The risk of collision exists with the use of hand-held and hands-free mobile phones. As hands-free mobile phones are not safer, national legislation should consider their restriction during driving and implementation of the legislations that ensure safety on the road should be reinforced. The objective assessment of the contribution of mobile phones to road traffic injuries is recommended.

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Abstract

# What Causes the Most Death and Disability in Iraq, Findings from GBD Study 2016?

Abdulaal Chitheer

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## Abstract

**Background:** Global Burden of Disease study (GBD) is a systematic, scientific effort to quantify the comparative magnitude of health loss from all major diseases, injuries, and risk factors for all ages, sexes, and geographies, and over time. It provides a comprehensive assessment of all-cause and cause-specific mortality for 249 causes.

**Objective:** To report the most common causes of death and disability in Iraq, 2016

**Methods:** We used the 2016 GBD study for estimates of mortality and disability-adjusted life years (DALYs) of different cause of deaths and disabilities for Iraq available GBD result tool. Each value has a mean and a 95% uncertainty interval which means a range of values that include the correct estimate. All estimates were rates per 100,000 and age standardized. Percentages of change from 1990 to 2016 were calculated.

**Results:** Age-standardized mortality rate for all causes was 1,209 per 100,000 (1,026-1,385); NCDs accounted for 989 (835-1,141) with 6% decline from that of 1990, injury deaths increased by 61% to be second cause while neonatal/maternal/nutritional diseases declined by 46%. Cardiovascular diseases (CVD) was top cause of death; 613 (517-703) making 34% of all deaths, followed by cancers; 99 (80-117) which is increased by 4%. Age-standardized DALY rate for all causes was 44,138 per 100,000 (37,736-50,736). From which, NCDs accounted for 30,152 (25,905-34,708) with 6% decline from that of 1990, injury related DALYs was 8,546 (5,499-12,110) with 42% positive change, while neonatal/maternal/nutritional diseases declined by 44%. CVD was top cause of DALY; making 14% of total DALYs, followed by war/disasters; 4,255 (1,232-7,544) with 12% increase.

**Conclusions:** Major disease burden in Iraq made by NCDs, mainly CVDs with accountable rise in cancer and injury burden. About half of Iraqi people are disabled or prematurely died by preventable conditions. Sound preventive measures should be established, and decisions based on global estimates may enhance redirecting health policies.

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## Abstract

# Outbreak Investigation of Unexplained Abdominal Pain, Port Said Governorate, Egypt October 2017

Mohamed Gouda; M El Ghazaly; S Samy; S Refaey; A Kandiel

### Corresponding Author:

Mohamed Gouda

## Abstract

**Background:** On 12 October 2017, three cases of unexplained abdominal pain including one death after eating fresh unknown plant were reported to epidemiology and surveillance unit at directorate health affairs.

**Objective:** Investigation was done to confirm the outbreak, identify the risk factors, and provide control measures.

**Methods:** Outbreak investigation team defined a case as abdominal pain, diarrhea and vomiting. Active case finding was done and 3 cases were detected. One case died, and a questionnaire was filled for the two alive cases by surveillance team. One stool sample was collected for microbiological testing. The team collected water sample from occupation place for microbiological testing. The team collected samples from the unknown mushroom.

**Results:** The dead case consumed the mushroom 1 pm and the case deteriorated rapidly and died at 4.30 pm with acute hepatic and renal failure. Symptoms emerged in one case at 7 pm and active case finding was done for the third case which was hospitalized at 10 pm. Two alive cases had moderate symptoms. No more cases were detected. Age range was 43-55. The 3 cases were male workers in a resort. All sick cases consumed mushroom. The symptoms revealed were 100% vomiting, 100% diarrhea, 100% dyspnea, 33.3% malaise, 100% abdominal pain and 66.67% bitter tongue. Results of water and stool samples were negative microbiologically. The mushroom type was called the death cap (*Amanita phalloides*).

**Conclusions:** The outbreak was associated with consuming fresh collected death cap mushroom which is hepatotoxic. Control measures were taken to remove all implanted mushroom in the grass of resort and making announcement that there is a poisonous mushroom implanted in the grass. Follow up done for more cases.

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Abstract

# Food Poisoning in the Town of Hatem, Irbid (Jordan)

Zaina Khreisat; S Alqasrawi; M Abdallat

**Corresponding Author:**

Zaina Khreisat

## Abstract

**Background:** On 14 September 2017, one hundred and one residents in the town of Hatem in Irbid (Jordan) were admitted to local healthcare center and a city hospital in Irbid with symptoms of diarrhea, vomiting, fever, and abdominal pain after eating a meal from a nearby restaurant.

**Objective:** Identify the cause and mode of transmission and to implement control measures.

**Methods:** The food poisoning outbreak was described by time, person, and place. A case was defined as any person with two or more of the following symptoms: diarrhea, vomiting, fever, and abdominal pain, who had been in the town of Hatem (Irbid) in the period 14-19 September 2017. We conducted a cohort study and collected data on demographics, water sources, and food sources. We conducted environmental survey for water sources and for food in local restaurants for fecal contamination, and tested water, food, and stool samples for microorganisms.

**Results:** Among 8,000 residents, we identified 101 food poisoning cases. Outbreak was during 14-19 September 2017 with peak (73 cases) on 17 September 2017. Attack rate was the highest among residents aged 10-19 years (47 cases) and residents aged 5-9 years (33 cases). Females were more affected than males (58% vs. 42%). The food poisoning outbreak was associated with taking Hommos meal and Falafel from a local restaurant. The stool samples of patients and the restaurant owner were positive for *Shigella sonnei* and *Escherichia coli*. The ground Hommos samples taken from the local restaurant were positive for *Shigella sonnei*.

**Conclusions:** The food poisoning outbreak in the town of Hatem in Irbid (Jordan) was associated with eating Hommos meal and Falafel from a local restaurant contaminated with *Shigella sonnei*. We recommend periodic inspection and active monitoring of water and food, as well as of the caterers, across the county to reduce the likelihood of such outbreaks.

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## Abstract

# Investigation of a Collective Foodborne Illness Shows a Multi-Pathogen Contamination in Training Institute in Rabat, June 2017, Morocco - A Case Control Study

Moumni Abdou Houda; D Ilhame

## Corresponding Author:

Moumni Abdou Houda

## Abstract

**Background:** Foodborne diseases outbreaks are common worldwide and an important public health issue. According to WHO, approximatively 600 million of foodborne illness and 400 thousand related deaths per year. In Morocco, an average of 1500 cases is notified annually. On June 18, 2017, the public health service was alerted about 43 suspected students in a training Institute in Rabat admitted in emergency for collective foodborne disease following an uptake of meal a day before.

**Objective:** We investigated this outbreak to confirm the outbreak, to identify the source of contamination and to recommend control measures.

**Methods:** We conducted a case control study. We selected cases and controls in the ratio of 1:1. We defined a case as anyone who attended the meal served on 17 June 2017 at the Institute's restaurant and presented in the two days after diarrhea and one of the following signs: nausea, vomiting, abdominal pain, fever, and dizziness. A control was defined as anyone who had consumed the same meal and had not presented any digestive signs. We conducted bivariate and multivariable analysis. Stools of ill students were collected, and food specimen was collected for bacterial testing.

**Results:** Among 100 students interviewed, we identified 50 cases. Among cases, males were predominant (86%), the median age was 21 years. 47 sought medical care. The episode was short with an estimated average incubation period of 9 hours. The epidemic curve oriented towards a common source of contamination. Among food items, Briwates were strongly associated with the illness with an odd ratio of 14.23 (5.04-40.04). Laboratory testing of Briwates found EColi O157 and Staphylococcus Aureus.

**Conclusions:** This was an outbreak associated with the consumption of Briwates contaminated by two germs, which was the source of this episode. We recommended to strengthen hygiene measures and safe food handling, to raise awareness and educate the staff.

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Abstract

# Outbreak of Foodborne Disease in Hajj Camp During Hajj Season 2017

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Turki Alaslani**Corresponding Author:**

Turki Alaslani

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**Abstract**

**Background:** On 30th August 2017, the Food Safety Department of Saudi Ministry of Health received notification of potential outbreak of foodborne illness among Hajj pilgrims. Residents from the Saudi Field Epidemiology Training Program team and public health officials investigated the outbreak to identify the source and prevent additional illnesses.

**Objective:** To investigate the outbreak and identify the main source of foodborne illness.

**Methods:** A case control study was conducted, with a case definition as any pilgrims who ate lunch meal at the Fajr Al Eman Hotel on Wednesday 30th August 2017 and experienced abdominal pain, diarrhea, vomiting and fever. The ratio of cases to control was 2:1. A standardized questionnaire was used to collect information on symptoms, onset of illness, and food history.

**Results:** In this study we identified 30 (15 males and 15 females) cases and 60 controls. The most commonly reported symptoms were abdominal pain (100%), diarrhea (24%), vomiting (3%) and fever (17%). The epidemiological curve shows that the onset of the first cases was at 3:00 AM on Thursday 31/08/2017 then the cases started to increase gradually until 9:00 PM on the same day; the peak was at 3:00 PM. The incubation period was 6-32 hours with a mean of 22 hours. The analysis showed a statistically significant association with eating lamb meat and tomato stew ( $P=0.03$  for and  $P=0.04$ , respectively). The association with the other two kinds of food; rice and Kubah were not statistically significant. All laboratory results were negative.

**Conclusions:** According to the clinical picture and the incubation period, the probable causative organism might be Salmonella, or E. coli. The outbreak was epidemiologically linked to the lamb meat and tomato stew. At the same time the delay of notification could be the reason behind the negative laboratory investigation. To prevent any similar future outbreaks, an improvement in food transport pathway and food storage is recommended.

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## Abstract

# Cholera Outbreak Investigation in Sawan Area, Shuaub District, Sana'a Capital City, Yemen, October 2016

Ahlam Alsaïdi; M Al-Amad; N Al-Abhar; L Al-Zagar; Y Abdaulwareth

## Corresponding Author:

Ahlam Alsaïdi

## Abstract

**Background:** Diarrheal diseases are the second leading cause of death among children <5, 1 in 9 children die from diarrhea infection worldwide. The majority (88%) of these deaths are associated with unsafe water, inappropriate sanitation and lack of hygiene. *Vibrio Cholerae* bacterium can cause extremely virulent diarrhea. On October 2016 an outbreak of watery diarrhea occurred among a family in Al-Nasser St. Sawan area, Shuaub district, Sana'a capital city, Yemen.

**Objective:** An outbreak investigation was done to confirm the outbreak, to identify the source, risk factors and recommend control measures.

**Methods:** A descriptive and analytical studies were conducted. Active search of cases and control was performed. WHO case definition of cholera during epidemic was adopted. Stool samples were taken and sent to the public health central lab. for confirmation. The data was entered and analyzed by Epi Info 7.2 and Excel sheet were performed. Chi square and odds ratio were calculated.

**Results:** Out of 28 cases, 15 (54%) were females. The index case, a 65 years-old female, was identified on October 3rd. The peak of cases was on October 8th, 2016 (46%). The attack rate was 3/1000 population with no case fatality. Children < 5 (24%) and those 5-10 years (24%) were mostly affected. Out of 18 stool samples, 11 *Vibrio cholera* serotype 01 Eltor-ogawa was isolated (61%). The identified risk factors were: untreated water OR=10.7, (CI: 3.95-29.1) grape OR=4 (CI: 1.5-10.8), and porridge OR=3.1 (CI: 1.4-7.5).

**Conclusions:** Cholera outbreak was confirmed. Most cases were children up to ten years old. There was association between drinking water, eating raw vegetables and cholera infection. Boiling or chlorination of water and hand washing were recommended to control the outbreak

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Abstract

# A Food Poisoning Outbreak in Al-Khazir U2 Camp of Internally Displaced Persons - Iraq, Summer 2017

Kamal Kadhim; K Fathallah; Al Jaafar; A Hamad; S Saadoon; Z Awad; F Lami

**Corresponding Author:**

Kamal Kadhim

## Abstract

**Background:** Globally, about 600 million fall ill and 420,000 die every year after eating contaminated food. On June 12, 2017, Iraq CDC informed about a food poisoning outbreak among internally displaced persons (IDPs) in Al-Khazir camp, Northern Iraq after consuming “Iftar” (Ramadan breakfast) provided by an NGO. “Iftar” was composed of rice, white bean broth, chicken, yogurt, date and bread.

**Objective:** The objective was to describe the outbreak, identify the causative agent and recommend preventive measures.

**Methods:** A team of FETP residents dispatched to investigate the outbreak. The case patient was defined as any person in the camp who ate “Iftar” and developed nausea/vomiting or diarrhea or abdominal pain. A retrospective cohort study was initiated.

**Results:**

**Conclusions:** The large number of ordered meals from a single restaurant led to suboptimal food preparation and storage. We recommended rigorous implementation of food handling instructions and health education of the food handlers.

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## Abstract

# Outbreak Investigation on Acute Watery Diarrhea in Village Mir Khan Otho, District Shaheed Benazirabad, Sindh Pakistan, 2017

Aftab Khaskheli; N Masood

### Corresponding Author:

Aftab Khaskheli

## Abstract

**Background:** On 9th July 2017, media reported eight cases of acute watery diarrhea and abdominal pain in village Mir Khan Otho, District Shaheed Benazirabad to the DG Health Office Sindh in Hyderabad. On 10th July 2017 a team of FELTP fellows was deputed to affected village.

**Objective:** To confirm the outbreak, estimate the magnitude, evaluate risk factors and make recommendations.

**Methods:** Age and sex-matched case-control study was carried out. Active case finding was done. A case was defined as sudden onset of acute watery diarrhea (≥3 loose motions within 24 hours) with or without vomiting, fever or abdominal pain in a resident of Village Mir Khan Otho, between 2nd and 20th July 2017. A structured questionnaire was used to collect data. Frequencies and attack rates were calculated and bivariate analysis was conducted. Three stool samples were sent to People University of Medical & Health Sciences, Nawabshah for microbiological analysis.

**Results:** A total of 30 cases were identified (22 through active case finding) and n=16 (53.7%) were females. Mean age was 25.3 years (range: 1-50 years). Overall attack rate was 23%. People aged 21-30 years were the most affected (n=10; AR 43.5%). Apart from diarrhea, abdominal cramps (n=28; 93%) was the most common symptom. On bivariate analysis, consumption of water from the hand-pump near the swamp was significantly associated with the disease (OR=8.4, 95% CI: 3.1-22.7) while frequent hand washing had a protective effect (OR=0.3, 95% CI: 0.16-0.59). *Vibrio cholerae* was detected in 2 stool samples. A swamp was created near the hand pump due to recent rains.

**Conclusions:** The most probable cause of outbreak was contamination of hand-pump by swamp water. Hand-Pump was removed thereby culminating the outbreak. ORS and chlorine tablets were distributed and health education sessions on personal hygiene and treatment of drinking water was imparted to the community.

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Abstract

# Cholera Outbreak Investigation in Baghdad Al-Rusafa August-November 2017

Safaa Saadoon; R Hashim; Q Abdulaziz; H Ismael; M Ali; Z Wajih; S Saadoon; F Lami

**Corresponding Author:**

Safaa Saadoon

## Abstract

**Background:** Iraq is a cholera-endemic country with outbreaks occurring every 3-4 years. Since 29th, August 2017, Iraq CDC received reports on confirmed cholera patients in Baghdad/ Resafa (Eastern Baghdad with a population of 4.8 million). Up to Nov 29th the total number of confirmed cholera patients was 257.

**Objective:** To determine the epidemiological characteristics of the patients and identify potential risk factors.

**Methods:** A team of FETP residents dispatched to investigate the outbreak and developed a form to compile demographic and epidemiological data from all the patients' investigation forms that were filled at the treating hospitals. Then a case-control study conducted using the accessible cholera patients and neighbors' controls. The cholera case was defined as any patient with acute watery diarrhea, and isolation of *Vibrio cholera* O1 or O139 from a stool sample.

**Results:** Among the 257 confirmed cases, 51% were male, mean age was 38.2 years and 44% were illiterate. The attack rate was 5.4/100,000; the highest was in Baladiyat (13/100,000), Baghdad - Jadida (12/100,000), and Madain (8/100,000) districts. The case fatality rate was 1.17%. The significant risk factors were: drinking tap water (OR=5.2, 95% CI:2.2-12.5), using Reverse Osmosis water (OR=8, 95% CI:2.4-26.1), not using boiled water (OR=2, 95% CI:1.2-3.8), not practicing washing hand after using a toilet (OR=5, 95% CI:1.9-13.4), lack of awareness toward boiling water (OR=1.8, 95% CI:1.04-3.3) and history of having meals outside home within seven days preceding onset (OR=4.8, 95% CI: 1.9-12.2). No significant association found with the following factors: education, occupation, crowding index, house sewage disposal type, using aqua tabs, chlorine readings, and travel history.

**Conclusions:** Shortage of safe water and poor hygiene are still the main causes of cholera outbreaks in Iraq. Political commitment towards the provision of safe water and improving sanitary conditions are the cornerstone to stop these outbreaks.

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Abstract

# Outbreak investigation of Suspected Acute Watery Diarrhea Cases in a Village of District Shangla, Khyber Pakhtunkhwa, Pakistan in September 2016

Zee Shan; M Saleem

**Corresponding Author:**

Zee Shan

## Abstract

**Background:** On 18th September 2016, leading newspapers reported about 150 suspected acute watery diarrhea cases in a village in district Shangla. In response, FELTP Fellow visited the area on the next day.

**Objective:** To investigate the outbreak and take necessary control measures.

**Methods:** A case was defined as any person of any age and gender belonged to the reported village of district Shangla, with 3 or more episodes of loose stools per day with or without vomiting from 12-20 September 2016. Descriptive study was carried out by visiting the affected village to identify cases, areas and risk factors. District Health Information System reports were reviewed for any reported cases from that area during previous months. Admitted cases and other cases found during active search were interviewed. Samples from different water sources were taken and sent to laboratory for analysis.

**Results:** Three hundred and thirty-six cases were identified from hospital record and during active case finding in the affected village among population of 2800 (attack rate; 12%). Age range of cases was 5-65 years with mean age of 26 years. 32% (n=109) cases were females while 68% (n=227) were males. Male to female ratio of cases was 2.1:1. 27% (n=92) cases belonged to 20-29 years age group while 24% (n=81) from 30-39 years age group. It was found that 71% (n=237) cases were using spring water (attack rate; 8.5/100,000 population) and remaining 29% (n=99) were using other water sources (attack rate; 3.3/100,000 population). Laboratory reports confirmed presence of *Escherichia coli* in the spring water samples.

**Conclusions:** Use of contaminated water was the probable cause of outbreak. Outbreak was controlled, no death occurred, and cases have recovered. Health education sessions were conducted wherein community was advised to boil water for drinking and cooking. Supply of safe drinking water to the community was recommended.

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Abstract

# Acute Gastroenteritis Outbreak in Union Council Khirzan, District Khuzdar Pakistan - 2017

Abdul Razziq; B Saeed

**Corresponding Author:**

Abdul Razziq

## Abstract

**Background:** On 30th June 2017, district Health Officer (DHO) Khuzdar reported 60 suspected cases of acute gastroenteritis from union council Khirzan 2 days after heavy rains and flood in the area. DHO requested Provincial Disease surveillance and response Unit for investigation.

**Objective:** On 1st July 2017 a team was deputed to confirm outbreak, evaluate risk factors and recommend control measures.

**Methods:** A case was defined as sudden onset of 3 or more episodes of loose stools per day with or without vomiting in a resident of UC Khirzan District Khuzdar from 28th June to 4th July 2017. Active case finding was done in affected village and records of Rural Health Center were reviewed. A case control study was conducted. Age and sex matched controls were enrolled in a ratio of 1:1. Water sources and toilet facilities were assessed. Three water samples from water stream and household wells were taken and sent to NIH Islamabad.

**Results:** A total of 105 cases were identified with an overall attack rate of 1.08%. No deaths were recorded. Mean age was 27 years (range = 1 to 70 years). Males were more affected n=54 (51%). Most affected age group was 0-4 years (n=29, 27.6%) with attack rate 0.3%. Dehydration (n=95, 94%), nausea (n=80, 76.1%) and vomiting (n=70, 66.6%) were most frequent symptoms. About 95% of people practiced open defecation. About 78% of cases used stream water (OR= 11.40, 95% CI: 5.98-21.73) while 22% used well water (OR= 0.087, 95% CI: 0.046-0.167). Lab results showed coliform and fecal coliform organisms in stream water sample.

**Conclusions:** The most probable cause of outbreak was fecal contamination of stream water after floods. On recommendations of this study, community started boiling water before use and local authorities also distributed chlorine tablets for disinfecting water along with awareness regarding usage of latrines.

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Abstract

# Cholera Outbreak in Heran Area, Dhamar District, Dhamar Governorate, January 2017

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Labiba Anam**Corresponding Author:**

Labiba Anam

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**Abstract**

**Background:** On January 14, 2017, a suspected watery diarrhea outbreak was reported in Heran area, Dhamar district, Dhamar Governorate by electronic disease early warning system (eDEWS) coordinator. A team from FETP had investigated the outbreak.

**Objective:** To confirm the outbreak, find out the source, and recommend control measures.

**Methods:** Unmatched case control study was conducted with ratio of 1:2 respectively. A case was defined as a person with acute watery diarrhea, with or without vomiting in Heran area. A control was defined as a person from the same house or neighborhood of a case who does not have diarrhea or vomiting. Data were collected from cases and control using semi-structured questionnaire including basic demographic information, potential food and water exposures, and hygienic practices. Seven stool samples were taken only from patients for laboratory confirmation of cholera by culture. Water and sewage samples were also taken. We performed bivariate analysis using Epi-Info version 7.2.

**Results:** A total of 12 cases and 24 control that met the case definition were recruited. About 83% of cases were clustered in one house, 40% of cases aged 7-14 years, and 58% were females. The overall attack rate in Heran area was 0.1% and the case fatality among cases was 8.3%. The only significant risk factor identified was poor sanitation [OR=5.9, 95% CI:1.1-32.9]. *Vibrio cholera* O1 serotype Ogawa was isolated from all stool samples but all water samples were found to be negative.

**Conclusions:** An outbreak of cholera was confirmed in Heran area, Dhamar governorate. Poor sanitation was identified as possible mode of transmission. Therefore, improving environmental sanitation through setting up a sewage system is needed. Boiling water and chlorination are also recommended with increasing community awareness regarding the importance of hand washing and safe water and food hygiene.

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## Abstract

# Acute Watery Diarrhea (AWD) in a Chashma village of Ibrahim Hyderi, District Malir Karachi, Sindh, Pakistan - 2015

Jamshed Khan

## Corresponding Author:

Jamshed Khan

## Abstract

**Background:** On 4th August 2015, electronic media reported unusual occurrence of acute watery diarrhea (AWD) cases and one death in Chashma village at Ibrahim Hyderi, District Malir, Karachi. On same day, District health authority deputed 3 members team to identify the source, risk factors and recommend preventive measures.

**Objective:** To estimate the extent and magnitude of the outbreak, to assess risk factors associated with the outbreak, to institute control measures, and to formulate recommendations for future prevention.

**Methods:** A matched case control study was conducted. Case was defined as any person living at Chashma village, who has 3 or more watery stools in last 24 hours from 2nd to-10 August 2015. Review of hospital records and active case finding was done. Age and sex matched controls (1:1) were taken to analyze risk factors. Environmental assessment was done. Six water samples and rectal swabs were collected to isolate the causative agent.

**Results:** A total of 189 diarrhea cases were identified out of which (56%) were female. Mean age was 32 years (range: 4- 64 years). Along-with diarrhea (100%), the abdominal pain (56%), Vomiting (54%), nausea (11%), blood in stool (6%), and fever (2%) were the predominant symptoms. Case fatality was 3.2 with Attack rate 1.4%. Drinking water from storage tank (OR 12.8, CI 1.5-14,  $P$  value  $<0.05$ ) found strongly associated with the illness. Sanitary assessment revealed that usage of contaminated drinking water from storage tank resulted outbreak. The water samples were unfit for drinking due to presence of coliform bacteria. *Vibrio cholera* O1 El Tor Bio type isolated from 4 of 6 stool samples.

**Conclusions:** Contaminated storage tank water was possible source of outbreak. Immediately evacuate and contain the water tank. Poor personal hygiene and sanitation may be aggravating factors. Health education regarding hygienic practices and use of safe drinking water were imparted. Chlorinated tablets distributed. Washing and bathing was prohibited at drinking water source. Sustained health education and provision of purified water were recommended.

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Abstract

# Diphtheria Outbreak in Village Khabri Bhatt Tehsil Salehpat District Sukkur, Pakistan, 2016 - A Descriptive Study

Shumaila Rasool; N Masood

**Corresponding Author:**

Shumaila Rasool

## Abstract

**Background:** On 9th September 2016, 2 deaths reported in local newspaper due to unknown disease of respiratory system in village Khabri Bhatt Tehsil Salehpat, District Sukkur. On 10th September FELTP fellows visited the affected village.

**Objective:** To assess the cause of death, evaluate the magnitude of outbreak, and to recommend control measures.

**Methods:** A descriptive study conducted. Active case finding done and data collected using pretested questionnaire. Health facility records checked and verbal autopsies carried-out. A case was defined as any person with fever, throat pain and Greyish white membrane on Tonsils or nasal mucosa or Pharynx or larynx with or without any of the following symptoms including: neck swelling, difficulty in swallowing residing in Union council Tarai from 20th August to 10th September 2016. Data was analyzed while using MS Excel and Epi Info.

**Results:** Six cases including 2 deaths identified (CFR=33%). Median age of 7.1, males 83% and females were 17%. Affected age group was between 5-10 years with 2.8/1000 followed by 0-5 Years with attack-rate of 2.5/1000. Overall attack rate was 4/1000. Clinical Features were Fever, sore throat, difficulty in swallowing 100% and cough 33%. On examination Rhinitis 83%, tender enlarged cervical Lymph nodes 67%, Tonsillitis 100% and whitish membrane on tonsils 67%. Vaccination status of cases for Pentavalent I, II, III was 17%. Seven clusters of routine immunization checked on recall BCG (51%), Penta-I 4%, Penta II 2%, Penta III 2% and Measles-I 38%.

**Conclusions:** Outbreak was most probably due to very low routine immunization coverage and poor health seeking behaviors contributed the mortality. Area was remote and health facilities were far-flung from the reach of affected population. Mortality was due to non-availability of Diphtheria anti-toxin and improper medication. Outbreak was timely contained with initiation of focused vaccination. VPD Surveillance and EPI activities must be enhanced.

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Abstract

# Investigation of Cholera Outbreak at Rawalpindi, Pakistan - August 2017

Khurram Akram

**Corresponding Author:**

Khurram Akram

## Abstract

**Background:** Cholera is endemic in Pakistan with many outbreaks during the summer season. On July 29, 2017, two suspected cholera cases were reported from a tertiary care hospital in Rawalpindi. On the request of District Health Authorities, a team was constituted.

**Objective:** To assess the magnitude of the outbreak, evaluate possible risk factors and recommend control measures.

**Methods:** Investigation was carried out from Aug 01-15, 2017. Hospital records were reviewed, and active case-finding was conducted. A case was defined as sudden onset of loose watery stools (3 in past 24 hours) with any of the symptoms like vomiting, nausea, abdominal cramps or fever in a resident of Dhok-Paracha, Amarpura & Dhok-Chaudhriyan, Rawalpindi, from July 19-August 07, 2017. Age and sex-matched neighborhood controls were enrolled. Data was collected using a structured questionnaire. Four stool samples and three water samples were sent to National Institute of Health for microbiological analysis

**Results:** A total of 30 cases with 02 deaths (CFR 2.2%) were identified out of which 28 cases were detected through active case-search. There was a male predominance (n=20, 66%) with mean age of 13.7 years (range: 02 months-55 years). Overall AR was 0.68% with 16-20 years being the most severely affected age group (AR 1.8%). Out of 30 cases, 14 were consuming well-water (OR 10.37, 95% CI 3.61-29.74) and 12 were consuming tap water (OR 3.94, 95% CI 1.54-10.08). Water samples showed presence of coliforms (240 CFU/100 ml). *Vibrio Cholera* Serotype Inaba isolated from stool samples. Heavy rainfall was recorded (455.5 ml) from June 26 to August 6, 2017.

**Conclusions:** Consumption of contaminated water was the most probable cause of the outbreak. Contamination of water sources during recent flash floods was the source of contamination. Chlorination of water sources was conducted. Health awareness sessions on safe drinking water were conducted in the community.

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## Abstract

# Diphtheria Outbreak in Bait Hulboob, Wasman Villages, Ibb governorate - Yemen, September 2017

Ali Alhasani

## Corresponding Author:

Ali Alhasani

## Abstract

**Background:** Remerging of diphtheria outbreaks have been associated with wars and threaten the health of children and adult. On 25th of September 2017 surveillance officer of Ibb governorate received a notification from surveillance coordinator of Alsaddah district about suspected deaths due to diphtheria. A team from Ibb surveillance office was sent to investigate on 26/09/2017.

**Objective:** To verify the existence of an outbreak, describe its epidemiology and recommend preventive and control measures.

**Methods:** A descriptive study was done. WHO case definition was used. A line list was created, active case finding, and clinical diagnosis were performed. Records of surveillance and vaccinations programs were reviewed. Data was entered and analyzed using Excel program. Descriptive statistics were performed.

**Results:** A total of 63 cases were identified. The first case was in Epi week 34, the highest peak with 32 cases were in week 38. The index case was 17 years old male from Bait Hulboob village. The majority of cases 47 (74%), were from that village. Almost three quarters of cases 45 (71%) were males, 22 cases (35%) among children aged from 5-10years. 43 cases (68%) was unvaccinated and the rest was partially vaccinated. All presented with pseudo membrane, 42 cases (67%) with sore throat and 10 (16%) with bull neck. The attack rate was 15/1000. 4 cases died (the case fatality rate was 6%).

**Conclusions:** Diphtheria outbreak was clinically confirmed. Low vaccination coverage. Vaccination campaign for population and provision of Diphtheria antitoxin for patients are urgently recommended. Immunization and health education should be emphasized by governorate authority.

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## Abstract

# Investigation of a Measles Outbreak Identified by Front Line Polio Workers, District Shikarpur, Sindh - 2017

Aslam Pervaiz; M Ali

## Corresponding Author:

Aslam Pervaiz

## Abstract

**Background:** An innovative strategy; to identify the vaccine preventable disease cases from the community by the front-line polio workers during door to door OPV campaign, was adopted in district Shikarpur, Sindh. During polio field work training front line workers were also briefed about sign and symptoms of vaccine preventable diseases to identify and report their cases. On January 17, 2017 (1st day of OPV campaign) front line polio teams reported three measles cases including one death from a remote rural village. A team was deployed to confirm and determine the extent of the outbreak and implement preventive and control measures.

**Objective:** To confirm and determine the extent of the outbreak.

**Methods:** A case was defined as a child (= 15 years of age) residing in district Shiparpur, with: a generalized rash for three or more days, fever at or above 101°F, and one or more of the associated symptoms, including cough, or coryza, or conjunctivitis from 1st January to March 6, 2017. Active case finding was done from the community and health facilities. Blood samples from fourteen willing cases were collected and sent to NIH Islamabad for Laboratory diagnosis.

**Results:** Results Twenty cases were identified with one death (CFR 5%), 55% (n=11) were females. Mean age was 43 months (range: 11 to 108 months). Eight (40%) cases were identified by front line polio workers from remote areas. Eight cases were from two families. Fourteen (70%) cases were un-immunized and 6 (30%) partially immunized against measles. NIH Lab declared thirteen (93%) cases positive out of fourteen.

**Conclusions:** Cases appeared due to poor vaccine coverage. Mopping-up activities were conducted in the five villages with clustering of cases and in five KM radius surrounding areas. Innovative strategy of identify the vaccine preventable disease cases from the community by the front-line polio workers have proved successful and needs to be implemented across the country.

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## Abstract

# Diarrhea Outbreak Investigation in Weld-Rabiae District, Albaida Governorate, Yemen, 2016

Mahmood Abdulrazzak; M Alemad; A Al Shahithy; L Alzagar

### Corresponding Author:

Mahmood Abdulrazzak

## Abstract

**Background:** Globally, diarrheal disease is the second leading cause of death among children under five. Account for one per nine deaths of children. About 88% of diarrhea death cases associated with unsafe water, inappropriate sanitation and lack of hygiene. In Yemen, it is the second cause of mortality and morbidity in children. On 19 August 2016, an increase number of diarrheal patients was reported in Wild-Rabiae district, Albaida governorate notified by local surveillance coordinator. A team from FETP was sent for investigation.

**Objective:** To confirm the outbreak, find out the source, and recommend control measures.

**Methods:** A descriptive cross-sectional study was performed. Data were collected using modified CDC cases definition. Samples (drinking waters, and powder milk) were collected, and sent to the National Central Public Health laboratories for testing. Data were entered into Excel and analyzed using EPI-info program.

**Results:** A total of 53 residents met the case definition; 85% of them were in the neighborhood, and 15% were in the refugee building. All cases were children less than 15 years old. Age group of 1 - < 3 years was most affected (38%). About 60% of cases were male. The overall attack rate was 9.5% (13% in the refugee building and 9% in the neighborhood). The overall cases fatality rate was 7.5%. Drinking water in neighborhood and powder milk in refugee building were contaminated by coliform and E. coli.

**Conclusions:** Diarrhea outbreak among children less than 15 years old was confirmed in Weld-Rabiae district, Albaida Governorate, Yemen. Two sources of infection were identified; drinking water in neighborhood and powder milk in refugee building. Consumption of contaminated powder milk among the refugee building led to severe fatal diarrhea.

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Abstract

# Risk Factor Assessment of Hepatitis-E Outbreak at a Military Training Center - Karachi, Pakistan 2017

Rabia Subuktageen; N Azam; A Baig

**Corresponding Author:**

Rabia Subuktageen

## Abstract

**Background:** In Pakistan hepatitis E occurs in both sporadic and epidemic forms. On 30th March 2017, 30 suspected cases of hepatitis were reported from a military training center in Karachi.

**Objective:** A team of FELTP fellows was deputed to assess the magnitude, evaluate risk factors and recommend control measures.

**Methods:** The investigation was carried out in the military training center in Karachi. A case-control study was conducted. A case was defined as sudden onset of jaundice with or without fever, nausea, vomiting, loss of appetite, malaise, diarrhea and abdominal pain plus presence of Hepatitis E IgM on ELISA in a resident of military training center from 9th March to 12th May 2017. Cases were identified by reviewing hospital records and active case finding. Age-matched controls were selected from the same center. Water samples were tested for presence of coliforms. Frequencies were ascertained, attack rates calculated, and odds ratios were determined at 95% confidence interval and *P* value of less than 0.05.

**Results:** A total of 79 cases were identified (49 through active case finding). All cases were male with mean age of 22 years (range 18-45 years). Overall attack rate was 9% with most affected age group of 18-22 years (attack rate of 12%). Out of 79 cases 62 consumed tap water (OR 2.28, 95% CI 1.14-4.58). Consumption of filtered water from coolers and hand washing was shown to have a protective effect. Water samples were positive for coliforms. On environmental assessment water pipelines were seen to be running parallel to the sewage line

**Conclusions:** Consumption of contaminated tap water was the most probable cause of the outbreak. Cross contamination between the water and sewage lines was the possible source. Replacement of old pipelines and decontamination of drinking water before consumption was also recommended.

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## Abstract

# Measles Outbreak Investigation in Village Bara, Khyber Agency, Pakistan-February 2017: Case Control Study

Muhammad Ismail; A Khan

### Corresponding Author:

Muhammad Ismail

## Abstract

**Background:** Measles is highly contagious and remains a leading cause of childhood mortality. Outbreaks of Measles were reported from various parts of Pakistan, particularly tribal areas. In February 2017 Measles outbreak was reported from Bara, Khyber Agency.

**Objective:** To confirm the outbreak, assess its magnitude, identify risk factors and to implement prevention and control activities to stop spread of the outbreak.

**Methods:** A case was defined as Rash with fever and cough, coryza or conjunctivitis in a child younger than 14 years of age, resident of Bara, during 3rd February to 15th March, 2017. Active search of cases done. Data was collected using a pretested structured questionnaire and analyzed using Epi Info version 7.1. Descriptive analysis was done followed by age & sex matched case control study. Case fatality rate, attack rate, vaccine efficacy, and secondary infectivity rates were calculated.

**Results:** Total 42 cases were identified. The Epi curve ranges from 3rd February to 15th March with a bi-modal peak on 23rd Feb and 5th March. Mean age of the cases was 37 months (range 1-120 months). Males were 52.38% (n=22). Socioeconomic status of parents was poor (28.57% laborers, 38.10% earn below 10000 PKR/month, 59% fathers were literate while all mothers were illiterate). Case Fatality rate was 7.14% (n=3). Vaccination showed protective effect [OR 0.12 (95% CI: 0.03-0.40;  $P<.05$ )]. Vaccination coverage survey showed 46.3% coverage for Measles-1. Secondary infectivity was high in houses where children were more than 7 in number [OR 8.67 (95% CI: 1.76-42.6,  $P<.05$ )]. Distance from health facility (>3kms) showed higher odds of getting the illness [OR 2.89 (95% CI: 1.22-6.84);  $P<.05$ ].

**Conclusions:** This study in a post-conflict repatriated population showed relationship of low socioeconomic status, low vaccination coverage, distance from health facility and overcrowding with the disease. Awareness sessions and mop-up vaccination in the area contributed in controlling the outbreak.

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## Abstract

# Determinants for Genital Human Papillomavirus (HPV) Infection in Tunisian Women with Normal Pap smear: Are There Different Risk Profiles for Oncogenic and Nononcogenic HPV Types?

Hejer Letaief; A Hechaichi; H Bouguerra; F Saffar; S Chelly; A Cherif; S Rejaibi; M Mechala; K Chahed; S Bougatef; M Kouni; M Ardhaoui; E Ennaifer; S Boubaker

## Corresponding Author:

Hejer Letaief

## Abstract

**Background:** Most studies of risk factors for HPV infection have focused on overall HPV positivity and have not examined determinants for high-risk and low-risk HPV types separately.

**Objective:** To evaluate the prevalence and type distribution of high-risk and low-risk HPV infection and to describe the risk factors associated with different profiles in Tunisia.

**Methods:** We studied risk determinants for genital HPV infection in a randomly sample of women aged 18 years and older with normal cervical cytology in Tunisia during 2014. All women had a personal interview, a Pap smear, and cervical swabs for HPV DNA detection using a PCR technique. Information on sociodemographic, reproductive, lifestyle characteristics, and health-seeking behaviors was collected.

**Results:** The overall HPV prevalence was 7.5% (IC95% [5.9%-9.0%]). Prevalence of HRHPV was 4.8% (IC95% [3.7%-6.2%]) and LRHPV 3.8% (IC95% [2.8%-4.8%]). Of HPV-positive women, 64.0% (IC95% [53.8%-74.4%]) had high oncogenic HPV types, and 45.3% (IC95% [33.0%-54.8%]) had low oncogenic HPV types. Simple infection was predominant within 76.6% (IC95% [66.3%-83.9%]) of positive women. Younger age and lifetime measures of sexual activity (notably, number of partners) were the main risk factors for the oncogenic HPV types. A statistically increase risk was found in women whose partners had multiple sex partners. Furthermore, a previous sexual infection was associated with the high-risk HPV types. HR-HPV infection risk was observed in women aged less than 30 years, who were smokers, divorced/separated and having a high educational level. In contrast, the most important determinants for nononcogenic HPV infection were contraceptive variables related to the physical protection of the cervix and low standard of living.

**Conclusions:** The results indicate that different risk profiles exist for infections with different HPV groups with high-risk types being the most common types detected. HR-HPV positivity was associated with social determinants, behavioral and sexual characteristics. These results should assist in designing strategies for control of cervical cancer targeting at risk population.

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Abstract

# Measles Outbreak-Khywan, Huth District, Amran Governorate, Yemen, March, 2017

Mona Mayad; W Albakhshi

**Corresponding Author:**

Mona Mayad

## Abstract

**Background:** On March 3, 2017, cases with fever and skin rash were reported in Khywan, Huth district, Amran by electronic disease early warning system (eDEWS) coordinator. A team from Y-FETP was sent to investigate the problem.

**Objective:** To confirm the existence of outbreak and recommend control measures.

**Methods:** We conducted active house to house- case search. Suspected case was any person with fever and skin rash at any age in Khywan area, Huth district, Amran governorate, from 5 February to 5 March 2017. Data analysis was performed by Epi Info version 7.2.

**Results:** Results 32 cases met the standard case definition, the index case was reported in 5 Feb. 2017, the outbreak continued till 5 March with the peak of cases in 3 March 2017 (6 cases). The percentage of females was 53%. The highest percent was among the age group 1-<5 years with the attack rate 21/1000 of population. The percent of non-vaccinated cases was 97%. Reasons for non-vaccination were: lack of outreach vaccination services (39%), absence of vaccine in the nearby health center (39%), and vaccination refusal (22%). All cases had fever and skin rash, 97% of cases had cough and conjunctivitis. About 13% of cases were admitted in Huth hospital due to pneumoniae as a complication of measles.

**Conclusions:** Existence of Measles outbreak in Khywan area, Huth district, Amran governorate was confirmed. Urgent measles immunization campaign with ongoing routine and outreach immunization services are recommended to increase vaccination coverage.

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Abstract

# Trends of Performance Indicators of Acute Flaccid Paralysis (AFP) in Iraq, 2007-2016

Safaa Saadoon; F Lami

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Safaa Saadoon

## Abstract

**Background:** AFP Surveillance is a key strategy of Global Polio Eradication. In Iraq, it started in 1995. WHO established some performance indicators that should be used to assess the quality of AFP surveillance.

**Objective:** The objective of this study is to identify the trends of different performance indicators of AFP in Iraq, 2007-2016.

**Methods:** We reviewed AFP surveillance data in the IFA (Information for Action) software for 2007-2016. The data were compiled from almost all public health outlets in Iraq and compiled at the National AFP surveillance office. Six WHO indicators were reviewed: Non-polio AFP rate <15 years of age (Target >2/100,000), Reported AFP cases investigated <48 hours of report (Target >80%), Reported AFP cases with 2 specimens collected <14 days since onset (Stool adequacy) (Target >80%), Specimens arriving at national laboratory <3 days of being sent (Target >90%), Specimens arriving at laboratory in good condition (Target >80%) and Stool specimens from which non-polio enterovirus was isolated (NPEV%) (Target >10%).

**Results:** A total of 4,915 cases were reported; 35% aged <2 years, 60% were male, 60% had fever at onset of paralysis and 38% had asymmetrical Paralysis. Only 1.3% received no OPV vaccine, 77% received >3 doses. At sixty days' examination 24% had residual paralysis. Seven cases were vaccine-derived, 156 cases were Sabin-like polioviruses and no vaccine-associated polio case. Two wild polio cases reported in 2014. Guillain-Barre syndrome accounted for 51% of cases. Specimens arriving at the national laboratory <3 days was not achieved during the whole period. NPEV% achieved the target except in 2013 (7.3%). All other indicators achieved the target throughout the whole period.

**Conclusions:** While most indicators achieved the standard, additional efforts are still needed to address the timeliness of adequate stool specimens' arrival to the laboratory. We are currently working on similar analysis at governorates and districts levels.

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Abstract

# Antibiotics Prescribed Among Patients with Severe Acute Respiratory Illness in Bangladesh

Nisharga Meraj Chowdhury; M Abdul Aleem; M Sabrina

**Corresponding Author:**

Nisharga Meraj Chowdhury

## Abstract

**Background:** Proper use of antibiotics helps to minimize the recovery time of patients with severe acute respiratory illness (SARI). Although Bangladesh faces increasing concerns with antimicrobial resistance, there is no national guideline covering preferred antibiotics for SARI cases. Hospital Based Influenza Surveillance (HBIS) identifies SARI patients caused by different microorganism including influenza and other bacterial organisms.

**Objective:** We analyzed HBIS data to observe the antibiotic prescription pattern for SARI patients.

**Methods:** We analyzed HBIS data from May 2013 to December 2016 from 12 sentinel hospitals regarding length of hospital stay, chronic illness, different classes and generations of antibiotics prescribed to SARI patients. We used proportion test with 95% confidence interval to compare use of different classes of antibiotics.

**Results:** Out of 9146 reported SARI cases, 66.3 % were male and 33.7% were female. Among them, 86.6% patients were prescribed antibiotics. Overall, proportion of cephalosporin use was the commonest (54.1%) followed by penicillin (27.3%), macrolides (13.2%) and fluoroquinolones (2.7%). Although use of penicillin was higher (43.5%) than cephalosporin (38.1%) in elderly patients ( $P<.05$ ). The third-generation cephalosporin was most commonly prescribed (91%). Antibiotic prescription was higher in patients who had no chronic illness (87.2%) than those with asthma (84.1%), hypertension (81.5%) and diabetes (81.1%) ( $P<0.05$  for all comparison). SARI patients who were prescribed macrolides stayed in hospital for shorter period (median 3 days, 2-4 IQR) than those prescribed cephalosporin (median 4 days, 3-6 IQR) and penicillin (median 4 days, 2-6 IQR). In government hospitals cephalosporin was commonly prescribed (69.7%) than non-government hospitals (30.3%) ( $P<.001$ ).

**Conclusions:** Newer generation cephalosporin was most frequently prescribed, which raises the concern of developing antimicrobial resistance. As patients given macrolides had a shorter hospital stay may be recommended for SARI patients. However, development of a national guideline for management of SARI patients including appropriate use of antibiotic is recommended.

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## Abstract

# Measles Outbreak Investigation in Village, Mehmood Jamali, UC Ghandtar District Shaheed Benazirabad

Rukhsana Channar; N Masood

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Rukhsana Channar

## Abstract

**Background:** On 10th November 2017, District Surveillance Coordinator Shaheed Benazir-Abad notified eight suspected measles cases to Disease Surveillance Unit Hyderabad. Teams of Fellows constituted and deputed to the village to investigate the reported cases.

**Objective:** To verify, assess the magnitude, to evaluate risk factors and formulate recommendations for future control.

**Methods:** A descriptive study was carried out. Active case finding carried out; hospital records checked. Case was defined, a person resident of Jogi para Village Mehmood Jamali having fever with maculopapular rash and one of the following clinical features; cough, coryza and conjunctivitis from 1st November 2017 to 13th December 2017. Verbal autopsy was carried out with parents of deceased children. Data were analyzed using Epi Info 7.1.

**Results:** Total 37 suspected cases identified with 3 deaths (CFR 8%). Median age was 36 months (range: 6-216 months). Male were more affected n=27 (73%) than Females n=10(27%) most affected age group was 12 to 35 months n=23 (AR 1.5%) while overall AR was 1.2%. Fever and maculopapular rash n=37 (100%), coryza n=25 (67.5%) and cough n=23 (62%) were clinical presentation. Post measles complications were Pneumonia n=12 (32%) and diarrhea n=5 (13.5%). All cases were un vaccinated for measles vaccinations. The immunization status evaluation showed n=12 (32%) cases had not received measles-1 vaccination.

**Conclusions:** Measles outbreak was most probably due to very low routine immunization coverage. Outbreak was timely contained with active surveillance and initiation of Mop up vaccination. Cases were mobilized and admitted in hospitals therefore, no more deaths reported. There is need of strong supervision and monitoring of routine immunization activities in the district. Health education sessions should be arranged in the community on importance of immunization with active involvement of local stakeholders.

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Abstract

# Defining Influenza Baseline and Threshold Values Using Surveillance Data - Egypt, Season 2016-17

Basma AbdElGawad; S Refaey; H Abu El Sood; S El Shourbagy; A Mohsen; M Fahim

**Corresponding Author:**

Basma AbdElGawad

## Abstract

**Background:** Influenza infection represents a substantial public health problem resulting in global burden of mortality and morbidity. Influenza thresholds indicate level of disease activity that would signal the start or end of a season and provide an alert to an unusually severe or atypical season so, adjust preventive and control measures.

**Objective:** To establish baseline and threshold values for 2016/17 season.

**Methods:** Using Acute Respiratory Illness (ARI) surveillance data from 2013 to 2017, two parameters were assessed to monitor influenza activity: percentage of ARI samples positive for influenza and composite parameter (percentage of samples tested positive \*ARI rate). Three threshold levels (baseline, alert and epidemic) were established by calculation of average of each week in all preceding seasons, 40% Upper Confidence Limit (UCL) and 90% UCL of each week respectively, then a four-week running average used to smooth the curve. Each parameter was compared against corresponding threshold and transmission intensity was categorized as low, moderate and high.

**Results:** For season 2016/2017, both parameters showed two waves of activity crossing baseline threshold. First started at week 35 to 45 with dominance of Flu A/H3 activity (293(89) % of 329 positive samples, remain was Flu B) that exceeds epidemic threshold. The other, started week 12 to 14 with dominance of Flu B activity (136(99) % of 138 positive samples, remain was Flu A/H3). Percentage positive parameter signaled other weeks away from the defined season.

**Conclusions:** Public health actions were taken in response to the observed increase flu A/H3 activity, to trim the impact and serious consequences of the disease. Continuous calculation of baseline and threshold levels can assess not only seasonal influenza but also potential pandemic influenza, contributing to the country's pandemic preparedness and have important implications especially for resource-limited countries.

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Abstract

# Measles Outbreak in Village Manzoor Sawand District Ghotki, Province Sindh, Pakistan- 2016

Waqar Dahar; N Memon

**Corresponding Author:**

Waqar Dahar

## Abstract

**Background:** On 3rd December 2016, District Health office Ghotki reported three suspected measles cases from Village Manzoor Sawand to DG Health Office Hyderabad. On 4th December 2016, two FELTP Fellows were deputed to initiate an outbreak investigation.

**Objective:** The objectives of the investigation were to assess the magnitude, evaluate risk factors, and suggest control measures.

**Methods:** A review of the reported cases was conducted. Active case finding was undertaken to identify more cases in the village. A case was defined as sudden onset of fever, maculopapular rash, and any of cough, coryza, conjunctivitis in a resident of village Manzoor Sawand, from 10th November to 10th December 2016. Data was collected using a structured questionnaire. Vaccination coverage survey was done by using 30 x 7 cluster sampling technique. Six blood samples were sent to NIH for lab confirmation.

**Results:** A total of 15 cases including 2 deaths (CFR13.3%) were identified; 12 through active case finding. Mean age was 24 Months (range 9-54 months). Overall attack rate was 1/1000 and the most affected age group was 12-48 months n=13 (AR 3.8/1000). Apart from fever and rash cough (100%), coryza (80%) and conjunctivitis (60%) were the most prominent symptoms. A total of 210 children were assessed for vaccination status. Attack rate in unvaccinated children was 2.1% and in vaccinated children was 4.3%; vaccine efficacy was 51%. Reasons for non-vaccination was unawareness (n=12, 80%) followed by vaccinator did not visit (n=7, 46.6%). Ice-lined-refrigerator (ILR) was found to be non-functional at the EPI Centre. All blood samples were positive for measles.

**Conclusions:** The most probable cause of the outbreak was low immunization status. Awareness sessions were conducted. Vaccinator was assigned to conduct outreach activities. A total of 713 eligible children were vaccinated against measles and Vitamin A was administered. On our recommendations ILR was made functional.

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## Abstract

# Epidemiological Characteristics of Severe Acute Respiratory Illness Cases in Sentinel sites - Egypt, 2009-2017

Basma AbdElGawad; M Fahim; A Naguib; S El Shourbagy; H Abu El Sood; S Refaey

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## Abstract

**Background:** Severe acute respiratory illness (SARI) is recognized as a leading cause of morbidity and mortality. SARI tends to be rapidly progressive illness caused by pathogens like influenza, which have pandemic potential. Egypt established SARI sentinel surveillance sites since 2007 in eight representative sites.

**Objective:** Describe epidemiology of SARI, identify influenza positivity and circulating influenza subtypes among SARI patients.

**Methods:** Patients who met standard WHO- SARI case definition (fever  $\geq 38^{\circ}\text{C}$  + cough without any other cause in the last 10 days in a hospitalized patient) from 2009 to mid-2017, were enrolled. Epidemiological data were collected using standardized investigation form. Nasopharyngeal/ oropharyngeal swabs, for all patients, were tested for influenza viruses by reverse transcription polymerase chain reaction (RT-PCR). Data were extracted and analyzed by MS excel 2013.

**Results:** From January 2009 to July 2017, 22419 SARI patients were enrolled. The most affected age group was below five years with "5490(24.5%) of 22419". Median hospital stay was 5 days (IQR=3-7). During hospitalization, "159(0.7%) of 22419" were ICU admitted, out of them "65 (41%) of 159" were ventilated. Of all SARI admissions, 18.3% (CI: 17.8-18.8) were positive for influenza viruses, 37.9% (CI: 36.4-39.4) were FluA/H1N1 Pdm09, 30.3% (CI: 28.9-31.7) were Flu B, 23.8% (CI: 22.5-25.1) were FluA/H3N2 and 7% (CI: 6.3-7.8) were mixed influenza infections. Out of influenza-positive patients, fatalities were significantly higher ( $P < 0.001$ ) in pregnant women and those with preexisting chronic diseases, "41(5%) of 890" and "7(4.4%) of 158" respectively. Vaccination coverage was "13 (0.3%) of 4056" among influenza patients with zero fatality.

**Conclusions:** Influenza viruses are frequent cause of SARI admissions, so developing strategies to control Influenza is a key stone to reduce SARI. Improving influenza vaccination coverage for risk groups will prevent some SARI cases who are associated with fatal outcome.

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## Abstract

# Constraints Faced by Tb Patients Leading to Non-Compliance: A Cross Sectional Study in Mardan, Kpk, Pakistan

Yousaf Ali Khan

## Corresponding Author:

Yousaf Ali Khan

## Abstract

**Background:** Pakistan is among the high endemic countries for TB and ranked 5th in the high TB burden countries with estimated 4th highest prevalence of multidrug resistance (MDR) TB. TB patients in Pakistan are facing different socio-economic and cultural constraints. TB patients are stigmatized and have been affected negatively due to poor knowledge about the disease dynamics, wrong socio-cultural myths and misapprehensions in general public.

**Objective:** The study conducted by active TB patients to explore and evaluate different constraints that TB patients are facing in Mardan, Pakistan.

**Methods:** A cross sectional study was conducted in district Mardan during March to June 2015. From 350 selected patients 210 were enrolled in study after informed consents. Data were collected through structured questionnaire and statistically analyzed by Epi-info/SPSS.

**Results:** Overcrowding ( $P=.001$ , CI 95%), unawareness of disease (86%), low educational status ( $P<.002$ , CI 95%), poverty and access to healthcare facilities were directly related to poor compliance. Attitude of family members, colleagues, society and even healthcare staff ( $P=.002$ , CI 95%) were also found significant. Age groups, marital status and treatment duration were found to be highly significant ( $P<.002$ ). 85% patients were unaware with the risk factors and precautions during the treatment. 42% patients were unemployed, 58% employed less than 200 USD/month ( $P=.001$ , CI 95%). 59% patients complained worst behavior of their colleagues ( $P=.001$ ) and 41.7% complained worst behavior of healthcare staff ( $P=.003$ , CI 95%).

**Conclusions:** TB patients were found stigmatized due to poor economic conditions and bad attitude of family, colleagues and healthcare staff. Unemployment, malnutrition and overcrowding were among the worst constraints. Sensitization of medical staff and doctors to diagnose the disease in time and behave properly with patients is recommended. Dedicated patients and family education sessions must be conducted.

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Abstract

# Assessment of Awareness Towards Respiratory Infections Among Qatif District Pilgrims During Hajj 2017

Jassim Almogrin

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Jassim Almogrin

## Abstract

**Background:** Hajj is one of the largest human mass gatherings. Due to crowding, there is the potential for respiratory infections to spread among attendees. Health education and vaccination for respiratory infections are the main preventive measures taken for Saudi Arabian pilgrims prior to hajj.

**Objective:** To describe knowledge gained from preventive programs in Qatif district in Saudi Arabia's eastern province. This information can improve the health educational programs for Saudi pilgrims.

**Methods:** We randomly sampled pilgrims from 39 troops distributed across Qatif district. Questionnaires assessed pilgrims' awareness towards respiratory infections during hajj and to identify the factors influencing pilgrims' awareness about MERS-CoV in Saudi Arabia. Data analyses were completed using Epi Info 7.

**Results:** We surveyed 400 pilgrims from five different troops. Most (94%) were Saudi, 71% were between 20-40 years of age. For vaccinations, 75% of pilgrims were vaccinated against influenza, 87% for meningococcal, and 4% for pneumococcal. Half (50%) of pilgrims correctly identified drug effectiveness against respiratory infections. For knowledge, 85% of pilgrims identified sneezes and cough products as a cause of infections and contact with ill persons by 72%. Most pilgrims considered cough (65%), dyspnea (58%), sneeze (60%) and fever (56%) as common symptoms. For preventive measures, 91% of pilgrims identified face masks, 86% identified frequent hand washing and 85% identified social distancing as effective. MERS-CoV was identified a serious disease by 76%, and 30% said MERS-CoV was treatable. For transmission of MERS-CoV, 75 % identified airborne transmission and 60% identified consuming infected camel. Only 55% of pilgrims correctly responded that MERS-CoV is still circulating in the kingdom.

**Conclusions:** Pilgrim knowledge about causes, symptoms, and preventive measures for respiratory infections were acceptable, but knowledge towards respiratory illness treatment and MERS-CoV were poor. We recommend national health education programs target these areas in the future.

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Original Paper

# Epidemiology and Predictors of Survival of MERS-CoV Infections in Riyadh Region, 2016

Fahad Al-Jasser; R Nooh; R Youssef

**Corresponding Author:**

Fahad Al-Jasser

## Abstract

**Background:** MERS-CoV emerged as a zoonotic disease in Saudi Arabia with 1437 cases as of July 2016.

**Objective:** This study aimed at describing the epidemiology of MERS-CoV infection, clinical aspects of the disease and the determinants of survival.

**Methods:** Medical records were reviewed between April 2014 and December 2015 to identify admission and discharge with MERS-CoV. Patients' characteristics, epidemiologic and clinical data and laboratory results were extracted and described. Logistic regression analyses were used to model the determinants of the survival of these patients. Significance of the results were judged at the 5% level.

**Results:** 249 laboratory confirmed cases were admitted mostly in August (20.48%) and September (14.86%) of the year 2015. These cases were non-healthcare workers (85.14%), Saudi (58.63%), males (57.03%) with a mean age of  $46.71 \pm 17.92$  years. A third (39.36%) reported contact with suspected or confirmed cases, developed the disease after 6.2 days and continued to shed the virus for 13.17 days on average. The case fatality rate was 20.08%. The likelihood of being discharged alive was significantly higher among non-Saudi (OR=2.35), healthcare workers (OR=10.822), with no co-morbidities (OR=6.57).

**Conclusions:** MERS-CoV mortality is higher among older patients with severe disease. Further studies are recommended for a better estimation of the incubation period and the period of communicability and the role of animal reservoir.

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## Abstract

# Severe Acute Respiratory Infections with Influenza and Non-Influenza Respiratory Viruses: Yemen, 2011-2016

Mohammed Al Amad

## Corresponding Author:

Mohammed Al Amad

## Abstract

**Background:** Sentinel surveillance for severe acute respiratory infections (SARI) is an important tool to monitor influenza circulation and burden of other respiratory pathogens. In Yemen, two sites established at Sana'a and Aden city. Pharyngeal samples are tested for influenza and non- influenza by the Real-Time-PCR assay in NAMRU 3.

**Objective:** Describe severity of SARI as indicated by admission to intensive care unit (ICU) and fatality as well as associated influenza and non-influenza viruses among patients in the two sites to provide recommendations for improving SARI surveillance.

**Methods:** Data from 2012-2016 of SARI patients who admitted in the two sites based on WHO case definition was obtained from Ministry of Health, It analyzed by Epi info 7 and  $P < 0.05$  was the cut point for significance.

**Results:** 2,211 patients were admitted in the two sites, 32% in 2013, 62% from Aden, 63% < two years, 20% had chronic diseases and 35% admitted to ICU. Overall SARI fatality was 8% which was significantly higher in Aden than Sana'a (10% vs. 5%,  $P < 0.001$ ), among patients with chronic disease (14% vs. 6.5%  $P < 0.001$ ) and admitted to ICU (10% vs. 7%,  $P = 0.04$ ). Samples of 82% (1,811) patients were tested where influenza viruses (75% Type A) were detected in 5% (89) more in Sana'a than Aden (6% vs. 4%,  $P = 0.04$ ) compared to 36% (655) of non-influenza viruses that included 43% (279) Respiratory Syncytial Virus and 17% (109) Adenovirus. The fatality of confirmed influenza was 9 % compared to 8% for non-influenza viruses.

**Conclusions:** Our findings showed that children < 2 years are more affected by SARI. Both influenza and non-influenza viruses lead to mortality and necessitate prompt diagnosis and treatment. Expanding SARI surveillance to involve more hospitals at different governorate is recommended to give more comprehensive picture regarding SARI.

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Abstract

# Food-borne Illness Surveillance and Etiology of Diarrhea in Bangladesh

Mohammad Afzalur Rahman; M Flora; M Rahman; M Billah

**Corresponding Author:**

Mohammad Afzalur Rahman

## Abstract

**Background:** In Bangladesh, yearly 30 million people are affected by foodborne illnesses caused by Rotavirus, Vibrio cholerae, Escherichia coli, Shigella and Salmonella. Since 2013, the country has been conducting active foodborne illness surveillance (FBIS) in ten sentinel sites to collect epidemiological data and stool samples of acute watery diarrhea (AWD) cases.

**Objective:** To describe the microbiological findings of stool samples and their relation with epidemiological data of FBIS.

**Methods:** We described AWD cases reported in FBIS from 2014 to 2015 by age, causative organisms and analyzed cholera cases by behavioral risk factors and geographic area. FBIS defined AWD cases as >3 episodes of loose stools or <3 loose stools causing dehydration or at least a single episode of bloody loose stool in 24 hours among >2 months of age, and watery stools that changed from usual pattern and frequency among <2 months of age. To find statistical association, we performed z-test for two proportions.

**Results:** Among 4,064 enrolled AWD cases, stool culture identified 8% of cases as cholera, 3% ETEC, 2% shigella, and 1% salmonella. Microbiological test could not identify any specific organism in 86% of samples. Median age of cholera cases was 27 years (IQR: 18-40), ETEC 23 years (IQR: 1.7-42.5), salmonella 36 years (IQR: 25-50), shigella 19 years (IQR: 1.9-40), and no-organism 2.5 years (IQR: 0.9-33). Both proportions of cholera (23%) and taking food from roadside vendors (33%) were higher in 5-14 years age group. In Chittagong district, both proportions of cholera (26%) and drinking well water (21%) were higher than other districts. Cholera was associated with taking food from roadside vendors ( $P=.04$ ) and drinking well-water ( $P<.01$ ).

**Conclusions:** As the majority of stool cultures could not identify causative organisms, we recommend increasing the microbiological identification capacity of FBIS. We also recommend conducting studies to identify true association of cholera with taking food from roadside vendors and drinking well-water.

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Abstract

# Rising HIV Seroconversion Rates and Associated Risks Among Civilian Employees of Pakistan Army: A Case Control Study - Pakistan, 2017

Eisha Mansoor; N Azam

**Corresponding Author:**

Eisha Mansoor

## *Abstract*

**Background:** In 2004, Pakistan escalated from low-prevalence to concentrated phase of HIV epidemic. Despite global decline in HIV incidence since 1997, rate of HIV infections in Pakistan is persistently rising since 1990. Available literature focuses on key populations or localized outbreaks and is limited by short study duration and regional applicability of results.

**Objective:** We studied HIV seroconversion trends over a period of 8 years in a geographically diverse population and evaluated associated risk factors.

**Methods:** A desk review of HIV surveillance data from 2010 to 2017 was carried out at Armed Forces Institute of Pathology. A case was defined as any adult enrolled in Pakistan Army as civilian employee, initially screened for HIV but later seroconverted on ELISA and western blot. Case-control study was conducted on cases diagnosed in 2017. Age and sex matched controls were identified from same population sub-group. Structured telephonic interviews were conducted, and statistical analysis done at 5% margin of error.

**Results:** From 2010-2017, 109 cases of HIV were notified from 75,000 HIV negative civilian workers. Annual case count remained <12 till 2016 when it rose to 24. Upward trend continued in 2017 with 34 cases reported to date (183% increase from baseline). Acquisition of HIV was significantly associated with commercial sex activities (OR=5.71; 95%CI: 1.25-395). No statistically significant association was found for blood transfusion, surgical/dental procedure, barber shops visits, piercing or substance abuse.

**Conclusions:** HIV seroconversion rates among Pakistan Army civilian employees have increased significantly in past 2 years. Unlike HIV outbreaks previously reported from Pakistan, sexual route has been recognized as the predominant mode of transmission. Consequently, sex education sessions were conducted in all formations and a section on prevention of STIs was included in Pak Army health pamphlet. Similar focus is mandated on prevention of sexual transmission of HIV at national level as well for all vulnerable populations.

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Abstract

# MERS-CoV Outbreak at Domat Al-Jandal Hospital

Abdullah Al-Guaimy; S Kamel

**Corresponding Author:**

Abdullah Al-Guaimy

## Abstract

**Background:** Saudi Arabia was first to report MERS-CoV in the middle east region in 2012. Several outbreaks had occurred since that time and still occur. In August, 2017 an outbreak of MERS-CoV at Al-Jouf province in Saudi Arabia possibly linked to an index case who admitted to hospital while infectious.

**Objective:** A team of Saudi field epidemiology training program was responsible to investigate the outbreak, to determine causes and to prevent recurrence.

**Methods:** List of cases were obtained from hospital administration. Information was collected by interviewing infection control team, outbreak team at hospital, local MERS-CoV coordinator and by observing most relevant sections at hospital.

**Results:** A total of 13 cases of MERS CoV infection were reported at Domat Al-Jandal hospital. Of these 13 cases, 8 cases were health care workers (3 physicians and 5 nurses), 3 cases were contacts cases of the index case. Most of cases acquired infection by person to person transmission at male medical ward and intensive care unit, only 3 contacts cases may get infected when they brought the primary case to hospital. Attack rate among physicians was 12% and among nurses was 9.8%. We found that late diagnosis, improper isolation of patients and non-compliance on infection control protocols are the leading causes of spread of the infection.

**Conclusions:** Sorting and examining patients carefully at triage and emergency before admission to hospital, adhering to infection control protocols, applying effective isolation measures are a must in the way to stop or prevent any MERS-CoV infection at hospitals.

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## Abstract

# Evaluation of Malaria Surveillance System in Balochistan- 2017

Abdul Razziq; A Saeed

### Corresponding Author:

Abdul Razziq

## Abstract

**Background:** Globally, an estimated 212 million cases of malaria were reported in 2015. In Pakistan, health facility-based confirmed cases were reported to be 0.2 million. Total reported deaths were 34 as compared to estimated 740 deaths. Malaria information system (MIS) detected 0.084 million confirmed cases of malaria in 2016, in province Balochistan.

**Objective:** An evaluation of Malaria Surveillance System in Balochistan was conducted to identify strengths and weaknesses and make recommendations for improvement.

**Methods:** A desk review of literature, office records and reports were conducted in Provincial Malaria directorate Quetta from March to May 2017. Evaluation was conducted for the year 2016. Assessment of qualitative and quantitative system attributes was done using the framework of updated CDC guidelines for evaluating public health surveillance systems, 2001. A semi-structured questionnaire was used for interviews. Stakeholders were identified and engaged.

**Results:** Case definition was simple, and system was easy to operate but inflexible in accommodating additional information like outbreaks. Data quality was assessed as poor, because on random evaluation 30% forms were found completed. Timeliness was also poor as report took 2 months to reach Malaria directorate from district level. System had good acceptability, stability and representativeness. Sensitivity of the system was excellent 100% whereas PPV was 12.8%.

**Conclusions:** New approach of Malaria Control Program should be vector control rather than malaria control because coastal areas of Balochistan are at high risk for Dengue, Chikungunya, Zika and Yellow fever as these have common vector for spread. A software is strongly recommended for reporting of malaria cases which will improve the timeliness of reporting. During transmission season active case finding and taking blood samples from affected people would be highly effective in picking cases at right time for better management. All the staff working for malaria control and prevention should be trained for other vector borne diseases as well.

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Abstract

# Evaluation of Knowledge, Attitude and Practices of Adverse Drug Reaction Reporting Among Hospital Pharmacists-Mansoura, Egypt, 2016-Cross Sectional Survey

Mohamed El-sayed Abdel-Aziz Abdel-Aty

**Corresponding Author:**

Mohamed El-sayed Abdel-Aziz Abdel-Aty

## Abstract

**Background:** Adverse drug reactions (ADRs) are a major cause of drug related morbidity and mortality. Globally, about 5% of all hospital admissions are due to an ADR and 10%-20% of inpatients have at least one ADR during their hospitalization. Pharmacovigilance is the science and activities relating to the detection, assessment, understanding and prevention of adverse effects or any other drug-related problem(s).

**Objective:** To evaluate the knowledge, practice and attitudes (KAP) toward ADRs reporting and pharmacovigilance among hospital pharmacists in Mansoura, Egypt, 2016.

**Methods:** A cross-sectional study was conducted among random sample of hospital pharmacists in Mansoura, who were invited to attend a workshop on Pharmacovigilance. A structured pilot tested questionnaire was developed based on the previous literature. The questionnaire was distributed to the attending pharmacists before and after the workshop. Collected data was analyzed using SPSS v.16.0.

**Results:** Of the total 200 invited pharmacists, 95% attended and agreed to participate in the study. The majority were females (87%), with mean age  $30.6 \pm 4.2$  years. Before the workshop, the average percentage of correct answers on the knowledge items was 55% indicating a fair to poor score which had been enhanced after the workshop (90%). The majority of pharmacists had positive attitude toward Pharmacovigilance and agreed that ADRs reporting should be mandatory, prompt and online but without legal penalties on the reporter. According to their practice, the most reported ADRs were severe serious reaction (22.5%), unexpected reaction (21.5%) and unlabeled reaction (17.5%). Besides, the most barriers to ADRs reporting were uncertainty whether the reaction is actually due to ADR (25%), already well-known ADR (15.5%) and forgetfulness (14.5%).

**Conclusions:** Awareness campaigns, incorporation of pharmacovigilance in health education, mandatory online ADRs reporting system will greatly enhance implementation of pharmacovigilance in Egypt.

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## Abstract

# Evaluation of Dengue Surveillance System - Islamabad, 2017

Fawad Khalid Khan; M Baig; M Najeeb

### Corresponding Author:

Fawad Khalid Khan

## Abstract

**Background:** Dengue is a significant public health problem affecting 50% population worldwide. Every year 50-100 million cases of DF while 250000-500000 cases of DHF are reported worldwide. Mortality rate of DHF/DSS is 5-10%.

**Objective:** The study was conducted to evaluate the system in terms of its core functions, system attributes and challenges faced in order to make recommendations for improvement.

**Methods:** This evaluation was conducted during November 2017 at Islamabad District. A desk review of literature, departmental reports and documents was conducted. Quantitative and qualitative system attributes were assessed using Updated CDC Guidelines for Evaluating Public Health Surveillance Systems, 2001. Stakeholders were identified and interviewed. A semi structured questionnaire was used to collect data.

**Results:** Staff was trained in data collection and data entry. NS1 (Non-structural protein1) and dengue-specific IgM antibody test were available at all tertiary care hospitals to confirm diagnosis. Case definition was simple and strictly followed. Data flow was easy. System is less flexible but able to integrate with other systems. Quality of data was poor as 80% of filled forms were incomplete in demographic and clinical profile. Acceptability was good due to sense of ownership and good coordination among all stakeholders. Sensitivity was 27.6% and predictive value positive was 81.5%. Representativeness was poor, covering only tertiary care hospitals. Timeliness was excellent with daily reporting and case response within 24 hours. The system is useful as it provides dengue fever data base for planning and management purpose. System is stable, secure and available when required.

**Conclusions:** The evaluation shows the performance of dengue surveillance system was good overall. System is not representative but has ability to detect and respond to outbreaks within time. Expansion of the coverage to include all public and private healthcare facilities is needed. Regular data collection trainings are recommended. Feedback mechanism is necessary to ensure data quality.

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## Abstract

# The Epidemiological Profile of Viral Hepatitis B and C in Morocco Between 2013 and 2016

Ilham Dahbi; I Khoudri

### Corresponding Author:

Ilham Dahbi

## Abstract

**Background:** Hepatitis B and C virus infections (HBV/HCV) are a global health problem. Morocco is considered as a middle endemic country. HBV/HCV surveillance system was implemented in Directorate of Epidemiology by the Ministry of Health as an ongoing process of case investigation, data collection, analysis and also dissemination of data to public health professionals.

**Objective:** The aim of this study was to analyze the epidemiological profile of HBV/HCV infections during a four-year period.

**Methods:** This was a descriptive and retrospective study of HBV/HCV cases registered from 2013 to 2016 by 22 referral centers for viral hepatitis in Morocco. Registration of new cases was reported monthly via a reporting form using WHO case definitions. Socio-demographic characteristics, diagnostic circumstances, modes of transmission, clinical and biological data of suspected or confirmed cases were collected.

**Results:** A total of 1160 HBV/HCV cases were registered (95% HCV vs 5% HBV). Male/female ratio was 0.52 and 48% were married. Free Medical regimen was available in public health services for 90% of patients. HCV cases came mostly from two northern regions: Rabat (24%) and Casablanca (21%). Regarding diagnostic circumstances, cases were identified during screening (25%), systematic blood check (21%), cytolyse (18%) or during blood exams before surgery (13%). Infections were frequently transmitted during dental care (58%), followed by transfusion-transmitted infections in 8% of cases and sexually transmitted in 4% of cases. In 80% of cases, HCV were active. The presence of detectable HCV RNA sequences, 54% were Genotypes 1 and 43% were genotype 2.

**Conclusions:** This analysis is from the data of surveillance system recently implemented. It allowed us to have an idea about the epidemiological profile of HCV/HBV in Morocco. However, these results point out the necessity to reinforce the surveillance system by involvement of more different regions in order to report more cases, and also the computerization of notification process.

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Abstract

# Prevalence and Seroconversion of Viral Hepatitis B and C and HIV Among Hemophilia Patients in Baghdad, Iraq, 2016

Kamal Kadhim; F Lami

**Corresponding Author:**

Kamal Kadhim

## Abstract

**Background:** Hemophilia is an inherited bleeding disorder caused by a deficiency of either factor VIII (hemophilia A) or IX (hemophilia B). Treatment with intravenous replacement of these factors and blood carries the risk of transfusion transmitted viral infections.

**Objective:** We performed this study to estimate the prevalence and seroconversion rates and identify risk groups of hepatitis C (HCV), hepatitis B (HBV) and human immunodeficiency virus (HIV) infections among hemophilia patients in Baghdad City, Iraq, 2016.

**Methods:** We conducted this cross-sectional study by reviewing records of all hemophilia patients resided in Baghdad in 2016 and registered and received treatment in the four hemophilia centers in Baghdad. All hemophilia patients are annually screened for anti-HCV antibody, HBsAg and HIV antibodies. Positive samples are sent for confirmation at the Central Public Health Laboratory and the results are reported in the patients' records.

**Results:** The total number of registered hemophilia patients in Baghdad in 2016 was 639. There were 150 (22.9%) patients with HCV infection, six (0.9%) with HBV infection, and only one patient (0.2%) had HIV infection. The seroconversion rate for HCV was 8/1000 and for HBV was 1.7/1000. The median period between birth and acquiring HCV infection was 17 (IQR=24) years, and for HBV was 11.8 (IQR=9.4) years. Binary analysis, revealed the following statistically significant risk factors ( $P<0.05$ ) for acquiring viral hepatitis infection: age, severity of hemophilia, presence of inhibitors, type of treatment, no. of treatment products used and presence of target joints. After applying logistic regression analysis, the significant independent risk factors were: age (14-18years: OR=4.03; 95% CI: 1.25-12.94), (19-44years: OR=18.8; 95% CI: 6.69-52.85), (=45years: OR=5.18; 95% CI: 1.01-26.58) and severe hemophilia (OR=6.25; 95% CI: 1.27-31.25).

**Conclusions:** Despite screening of blood and blood factors, HBV and HCV infections still occurring in hemophilia patients. Closer monitoring of transfused blood and ensue vaccination of all hemophilia patients for HBV are recommended.

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## Abstract

# Evaluation of the Meningitis Surveillance System in Meknes, Morocco

Touria Essayagh; A Khattabi; S Essayagh; M Khouchoua

## Corresponding Author:

Touria Essayagh

## Abstract

**Background:** Meknes is a big city of Morocco with 860.972 population in 2016. It includes 47 health centers, 5 hospitals and 2 laboratories which one is implicate in meningitis surveillance. The Meningitis Surveillance System (MSS) was implemented in Meknes in 1995.

**Objective:** The objective is to evaluate the MSS and to identify its strengths and its potential gaps for its improvement.

**Methods:** The evaluation was based on the CDC guidelines, 2001 for evaluating surveillance systems. A questionnaire was structured and tested to evaluate simplicity and acceptability. Twenty health professionals at the prefectural epidemiology unit, the hospitals and the laboratory were interviewed. MSS Data across 2012-2016 were analyzed to evaluate the representativeness, reactivity and quality of the data.

**Results:** 207 cases were reported with an incidence ranged from 4 per 100.000 population in 2012 to 5 per 100.000 in 2016. 172 (83%) of the cases reside in urban areas and 183 (88%) were from the public sector. The Completeness of selected variables was 89% (184/207). The system was simple regarding structure and all interviewed staff considered the system acceptable. Of 32 confirmed meningococcal meningitis cases, 15 had a serotype confirmation result. The epidemiological investigation of the case after declaration was carried out on average on the day of the declaration.

**Conclusions:** The evaluation of the MSS has demonstrated its strengths, namely good data quality, acceptability and responsiveness. However, these weaknesses reside in the low proportion of the serotype of meningitis agents. These results suggest the need to consolidate achievements and reinforce the importance of routine meningococcal serotype according to clinical and laboratory best practices.

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Abstract

# Evaluation of National Electronic Disease Surveillance System (NEDSS) Regarding Typhoid Fever in Sharkia governorate, Egypt, 2016

Shereen Elghazaly; H Abu El Sood; S El Shorbagy; S Refaey

**Corresponding Author:**

Shereen Elghazaly

## Abstract

**Background:** Typhoid fever is a systemic infection caused by Salmonella Typhi. It is still common in the developing world, where it affects about 21.5 million people each year, 222 000 typhoid-related deaths occur annually worldwide. It can be prevented and can usually be treated with antibiotics. Cases are reported through National Electronic Disease Surveillance System (NEDSS) from all healthcare facilities to department of Epidemiology and Surveillance.

**Objective:** To identify strengths and weaknesses of surveillance system of reported typhoid cases for improvement and disease control.

**Methods:** The evaluation was conducted using CDC guidelines for evaluating public health surveillance. NEDSS data regarding Typhoid from 1st January 2016 to 31 December 2016 were extracted on an excel sheet for calculating completeness and timeliness. A structured questionnaire was used to assess the following attributes: Usefulness, Simplicity, Acceptability, and Stability. The assessment was implemented on four levels: central, Health directorate, Health district, Fever hospital levels. Sharkia governorate had been selected which was the highest governorate in reporting typhoid cases. Data were analyzed using Microsoft Excel.

**Results:** According to surveillance officers in all levels which interviewed (n=10), the mean of system usefulness, simplicity, acceptability and stability was 92.5%, 98.8%, 94%, and 85.5%, respectively. The mean completeness of some variables (Outcome, occupation, national ID, address, final diagnosis) was 75.9%. It takes 2 minutes for case/day for data entry and 27minutes/month for data analysis. Median time between electronic Insertion to Reporting and admission to Notification date was 1 day for both, IQR (3-1) and (2-1) respectively. Positive predictive value was 50%. Satisfaction of surveillance team was 100%.

**Conclusions:** The system is simple, flexible, stable, acceptable and useful for the surveillance team which is satisfied with their job, the timeline of reporting is considered acceptable in between different levels and Lack of laboratory confirmation of cases (use tube agglutination test only).

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Abstract

# Evaluation of Acute Flaccid Paralysis (AFP) Surveillance System in Bajaur Agency, Federally Administered Tribal Areas (FATA), Pakistan During 2015

Inayatullah Rehman; M Saleem

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Inayatullah Rehman

## Abstract

**Background:** Federally Administered Tribal Area (FATA) remains a major reservoir and source of transmission of polio to other parts of the country and abroad. Terrorism, war against terror and anti-polio activities from 2008-2014 in many parts of FATA have badly affected Acute Flaccid Paralysis (AFP) surveillance system. FATA contributed 70% (n=65) and 58% (n=179) in 2013 and 2014 respectively. Bajaur Agency shares borders with Afghanistan and Mohmand Agency due to which it remains a major reservoir of polio virus and has contributed 18 cases in 2010.

**Objective:** The of this evaluation was to identify strengths and weaknesses of the system to formulate recommendation.

**Methods:** CDCs updated guidelines for evaluating public health surveillance system 2011 were followed. Descriptive study was conducted in May 2015. Major stakeholders were identified and interviewed through Semi-structured questionnaire. Qualitative & quantitative assessment of AFP surveillance system attributes were done. Sensitivity and PPV was calculated using previous years estimates for FATA.

**Results:** Results System was found simple, stable and flexible. Representativeness was found average as not covering private sector. Sensitivity was 100% while predictive value positive was 48%. Cases with adequate stools were 81% (n=128). Completeness and timeliness of reports were 87% (n=26). Case investigations within 48 hours of report was 99% (n=156). Stool specimens collected within 14 days of paralysis onset were 81% (n=128). AFP cases with 60 days follow-up were 36% (n=58). Lack of ownership and accountability, poor data management and analysis, inadequate logistics and feedback were identified as major weaknesses.

**Conclusions:** Health care providers' knowledge regarding AFP was found inadequate and needs regular capacity building. There was lack of government ownership and this system needs official ownership at all levels in order to bring improvements. Human resources and logistics provision needs to be ensured. Regular surveillance data analysis and feedback to health workers is recommended.

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Abstract

# Evaluation of Acute Flaccid Paralysis (AFP) Surveillance System in Sukkur Division - Sindh Province, Pakistan, 2016

Waqar Dahar; N Memon

**Corresponding Author:**

Waqar Dahar

## Abstract

**Background:** Pakistan is among three countries in the world with ongoing wild poliovirus transmission. Pakistan established an AFP Surveillance system in 1995 and in 2000 further technical strengthening was provided to system at all levels by WHO. Sindh reported 8 confirmed cases of poliomyelitis in 2016 and 3 cases were from Larkana Division. An adjacent division, Sukkur, is a big reservoir for poliovirus and an intersection between three provinces.

**Objective:** The evaluation was conducted to identify the gaps in the surveillance system and suggest recommendations for improvement.

**Methods:** A descriptive study was conducted during November-December 2016. The study setting was Sukkur Division. Quantitative and qualitative attributes of the system were assessed using Updated CDC Guidelines for Evaluating Public Health Surveillance Systems, 2001. A desk review of literature, departmental reports and records was undertaken. Major stakeholders were identified and interviewed using a semi-structured questionnaire. Sensitivity and PPV were calculated by using WHO estimates of Sindh Province for previous year.

**Results:** Case definition used was simple and gathered all essential information. System demonstrated its flexibility by incorporating information on other diseases like measles and neonatal-tetanus (NNT). The System captured all cases from 3 districts of the Sukkur Division. Data quality is good with 90% of the reports being completely and correctly filled and timeliness of data sharing was excellent with 85% reports reaching the provincial level weekly. Representativeness is average as system has limited coverage of private sector. System sensitivity is 100%, whereas PVP is 0.087%. System functions showing good stability without any disruption.

**Conclusions:** Polio is marked for eradication hence the system is fulfilling its objectives. We recommend coverage of the system to be extended to private sector and report sharing at directorate level. Regular capacity building of the staff is recommended for maintaining the quality and timeliness.

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## Abstract

# Evaluation of Acute Flaccid Paralysis Surveillance System in Polio-Free Jordan, 2012-2016

Fatima Zerriouh; M Abdallat; L Ghaffari; I Iblan; K Abusal; N Sabri; Y Khader

### Corresponding Author:

Fatima Zerriouh

## Abstract

**Background:** As part of polio eradication strategy, World Health Organization (WHO) has established a global Acute Flaccid Paralysis (AFP) surveillance. In Jordan, AFP surveillance has succeeded to achieve the polio-free certification. However, there is a substantial risk of polio importation from neighboring countries including Syria and Iraq.

**Objective:** This study aimed to evaluate the AFP surveillance in Jordan to ensure that the system operates effectively in order to maintain the polio free status.

**Methods:** This retrospective study was based on secondary analysis of data routinely collected between 2012 and 2016 by the Jordan Expanded Program on Immunization (EPI). All AFP cases reported to the EPI during this period were included. The WHO minimum performance indicators were used to evaluate the quality of AFP surveillance. Data were analyzed using the data management system for AFP surveillance data and excel 2010.

**Results:** Cumulatively, 328 AFP cases had been reported during the study period. Almost half (51.3%) of cases aged between one and five years and 55.8% were males. All cases had been discarded. The most common cause of AFP was Guillain-Barre Syndrome (35.1%). Annualized non-polio AFP rate increased from 1.4/100,000 population under 15 years in 2012 to 4.3 in 2016. National and subnational sensitivity was not met in 2012 and 2013. Adequacy of stool specimens and timeliness of specimens arriving and processing in the laboratory were constantly above the WHO minimum target. Timeliness of investigation met the expected target but with a decreasing trend. The proportions of stool specimens where non-polio enterovirus (NPEV) was isolated were below the WHO minimum target except in 2016.

**Conclusions:** AFP surveillance system in Jordan is performing well, however additional efforts are needed to strengthen the subnational sensitivity. Moreover, laboratories are required to increase the NPEV isolation rate. Providing feedback to the reporters is recommended to maintain the reporting and investigation above the target.

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## Abstract

# Evaluation of Hepatitis B Surface Antigen Rapid Test in Detection of Hepatitis B Virus Infection in Salahaldin Governorate, Iraq, 2012

Abbas Abbas; A Sameer

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Abbas Abbas

## Abstract

**Background:** Hepatitis B virus (HBV) can be detected by different serological and molecular biological methods. Nationally, high laboratory cost and lack of availability of Enzyme linked immunosorbent assay (ELISA) technique in peripheral health facilities raise the need for evidence-based decision on the use of HBs Ag rapid test in detection of HBV infection.

**Objective:** to evaluate the validity of ACON- HBs Ag rapid diagnostic tests in detection of hepatitis B virus infection in sentinel sites at Salahaldin Province.

**Methods:** Cross sectional study conducted from 1st March to 1st September 2012 in three sentinel sites at Salahaldin governorate. Depending on Hepatitis B median endemic index of 10%, a total of 900 subjects of both genders attending these sentinel sites and screened by ELISA technique for HBs Ag presence, were re-screened by the ACON HBs Ag rapid test device. The ACON HBsAg One Step Test is a qualitative, solid phase, two-site sandwich immunoassay for the detection of Hepatitis B surface Antigen (HBsAg) in serum or plasma. Results of both techniques were compared and validity of HBs Ag rapid test was calculated statistically by SPSS version 17.

**Results:** ACON HBs Ag rapid test showed an overall sensitivity, specificity, positive predictive value, and negative predictive value of 92.8%, 99.6%, 97.9%, and 99.2% respectively. But nothing is perfect. These rapid tests fail to detect HBs Ag concentrations between the cutoff value to < 1 OD value.

**Conclusions:** ACON HBs Ag rapid tests proved to be valid in detection of HBV infection in peripheral health care facilities lacking ELISA machine. However, at these facilities we should depend on ELISA technique in detection of HBV infection in those subjects requiring invasive procedures.

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## Abstract

# Assessment of Competencies of District Surveillance Officers, Iraq, 2017

Rafal Altalib; F Lami; A Al-Safi

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Rafal Altalib

## Abstract

**Background:** Communicable diseases (CDs) surveillance is vital for early detection of outbreak and reduce CDs burden. Surveillance officers at the grassroots up to the highest level should be adequately equipped with field epidemiology competencies. In Iraq, district surveillance officers (DSOs) are responsible for compiling, analysis of CDs data from Primary Healthcare Centers (PHCs) in their district and forwarded to the provincial level.

**Objective:** to assess background characteristics, qualifications and competencies of DSOs in Iraq.

**Methods:** In this cross-sectional study, we involved all DSOs (136) in Iraq. We developed a structured questionnaire through a meeting involved central and provincial officers and academia. The questionnaire gathered data on demographics, service characteristics, status of competencies in basic epidemiology, biostatistics, surveillance, outbreak investigation, rapid response to health incidence, laboratory models, developing scientific report and basic computers skills. Questionnaires were sent and received from DSOs via e-mails.

**Results:** Results The response rate was 85.3%. About half of DSOs was responsible for <10 PHCs, while only 13.8% were responsible for 20-29 centers. Also, about 55% were responsible for 1-2 hospitals and only 10% were responsible for 3-4 hospitals. Males constituted 78.4%. The highest academic degree of 63.4% was a two years Diploma after high school. The proportion of previous training of the DSOs was: basic surveillance 69.8%, outbreak investigation 34.5%, basic epidemiology 26.7%, rapid response to health incidents 21.6%, laboratory models 19.8%, biostatistics 13.8% and scientific reporting 8.6%. DSOs who didn't attend any training activity were 15.6%. Cholera and food poisoning were the most frequently reported incident and outbreak investigated (53.8% and 43.8% respectively). Microsoft Word was the most frequently reported computer skill (48.3%).

**Conclusions:** Although DSOs are the backbone in CDs surveillance, their technical capacities were sub-optimal. We started training of 25 DSOs (as first cohort) using a 3-months frontline FETP model.

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## Abstract

# Impact of Training of Primary Healthcare Centers' Vaccinators on Immunization Session Practices - Wasit Province, Iraq, 2016 - An Interventional Study

Ali Amily; M Abbass; F Lami

## Corresponding Author:

Ali Amily

## Abstract

**Background:** Immunization is one of the successful and cost-effective health interventions that averts >2.5 million child deaths annually. WHO and UNICEF estimates of immunization coverage in Iraq in 2015 revealed 58% for DTP3 and 57% for measles. High-quality immunization session practices (ISPs) can ensure safer, more effective vaccination and higher coverage rates.

**Objective:** The objective of this study was to assess the impact of training of primary healthcare centers (PHCs) vaccinators on quality of ISPs in PHCs in Wasit province.

**Methods:** An interventional study was conducted on ten (18%) PHCs in Wasit province where two PHCs were randomly selected from each health district. ISPs were first assessed by direct on-job observation of immunization sessions through a single visit for each PHC using modified WHO immunization session checklists and findings were grouped into seven domains: vaccine and diluent management, cold chain management, session's equipment, registration, communication, vaccine preparation and administration and waste management. Then, the vaccinators in these PHCs were enrolled in a one-day training using WHO module Managing an Immunization Session as a training material. A second assessment was made one month later using the same method. Mean differences in the domains' scores were calculated.

**Results:** A significant improvement was clear in three domains: vaccine and diluent management ( $P=.005$ ), cold chain management ( $P=.01$ ) and vaccine preparation and administration ( $P=.003$ ). Eight PHCs (80%) showed improved, whereas the remaining two (trained vaccinators were moved away soon after training in one, while the other was conducting a badly managed campaign with influenza vaccine) showed some decline.

**Conclusions:** Training of PHCs' vaccinators was effective in improving ISPs. We recommend using this training module for other PHCs to improve utilization of immunization services. The impact on vaccination coverage may be assessed one year later.

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Abstract

# Assessment of Immunization Session Practices in Primary Healthcare Centers - Wasit Province, Iraq, 2016-17

Ali Amily; F Lami

**Corresponding Author:**

Ali Amily

## Abstract

**Background:** Annually, vaccines prevent more than 2.5 million child deaths globally. WHO and UNICEF estimates of immunization coverage in Iraq in 2016 revealed 63% for DTP3 and 66% for MCV1. Wasit is among governorates with a large number of under-immunized children, opening the door for many future outbreaks. Immunization session practices (ISPs), when maintained of high-quality, can ensure safer and more effective vaccination as well as higher coverage rates.

**Objective:** The objective of this study was to assess ISPs in Primary Healthcare Centers (PHCs) in Wasit province.

**Methods:** We conducted this cross-sectional study on 24(44%) PHCs in Wasit province, selected by simple random sampling. Based on WHO and the national guidelines, checklists were developed to assess 58 ISPs that were grouped into seven domains: vaccine and diluent management, cold chain management, session's equipment, communication with clients and caregivers, vaccine preparation and administration, card review and registration and waste management. The score (out of 100%) was calculated for each domain in all selected PHCs, then the average for all domains was calculated in each PHC. The assessment was made by direct on-job observation of immunization sessions, through a single visit conducted to each PHC.

**Results:** PHCs were ranging in their ISPs: 52-78%; with a mean of 67% ( $\pm 8\%$ ). The highest scores were for the following domains: session's equipment (88%), waste management (82%) and card review and registration (81%). The least achieving domains were: communication with clients and caregivers (36%) and cold chain management (38%). Vaccine preparation and administration was scoring 69%, whereas the score for vaccine and diluent management was only 50%.

**Conclusions:** ISPs practiced in PHCs in Wasit province were far from the standard. National Expanded Program on Immunization should work on raising the capacity of vaccinators, particularly their communication skills with the clients and caregivers and the management of vaccines and cold chain.

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Abstract

# Epidemiological Profile of Meningitis in Prefecture of Temara, Morocco, 2011-2016

Azddine Bouzid; M Adnane; N Derfoufi

**Corresponding Author:**

Azddine Bouzid

## Abstract

**Background:** Meningitis remains a serious public health problem worldwide. Morocco has implemented a national program against this disease since 1989, but it still causes high morbidity and mortality, with an average rate of lethality of 10%.

**Objective:** Our study aims to describe the epidemiology profile of meningitis in the prefecture of Temara from 2011 to 2016.

**Methods:** We conducted a descriptive study of all cases of meningitis reported to the Provincial Epidemiology Unit (CPE) of the province of Temara in Morocco between 2011 and 2016. We collected data from the database of the CPE at the prefectural delegation of health. Data analysis was done using the Epi-info software.

**Results:** During our study period, we recorded 140 meningitis cases. Trend shows a maximum of cases in 2012 (34.0%), because we tested an application of instant declaration via internet which was abandoned. Cases were males in 59.0% and most were in urban areas (80.0%). The mean age was 40.5 years and the most affected age group was 5 to 15 years (28.5%). Most cases of meningitis (51.4%) were presumptively attributed to bacterial pathogens without final determination of causative organisms, and a third of cases were viral meningitis (30.0%). Only 9.0% of cases were culture-confirmed. The mains pathogens were Nesseria meningitidis (5 cases = 38.5%) followed by pneumococcus (4 cases, 30.7%) and Heamophilus influenza (1 case, 7.6%). Among patients with known outcome (n=36), case-fatality rate was 33.3%. Investigations around cases were carried out.

**Conclusions:** Meningitis remains an important cause of mortality in Morocco. Surveillance needs to be improved, particularly by computerizing case notifications. Laboratory conditions and improved methods of bacterial detection including isolate serotyping should be available to increase the confirmation rate. We also need to strengthen the involvement of the private sector which is very weak in notification.

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Abstract

# Evaluation of Lab-based Influenza Surveillance System in Pakistan, 2017

Nadia Noreen

**Corresponding Author:**

Nadia Noreen

## Abstract

**Background:** Globally 5-10% of adults and 20-30% of the children are affected by influenza annually. Annual epidemics results in 3-5 million cases and 500,000 deaths. Influenza is a common illness in Pakistan however absence of a robust surveillance system makes assessment of burden of disease an issue.

**Objective:** The study was conducted to identify key strengths and weaknesses of the system and to make recommendations based on findings.

**Methods:** An evaluative descriptive study was conducted from April to July 2017. The Lab-based Influenza Surveillance System was conducted at the national level. Assessment of qualitative and quantitative system attributes was done utilizing the CDC's Updated Guidelines for Evaluating Public Health Surveillance Systems, 2001. Desk review of literature, departmental documents and reports were also conducted. The stakeholders were identified and interviewed using a semi-structured questionnaire.

**Results:** The system was found to be simple and easy to operate but less flexible to integrate with other diseases. Data quality was good as 80% of observed forms were completely filled. Timeliness was good as the data takes 24-48 hours from sample collection to report submission to the central level. Acceptability is good as private and public-sector hospitals and labs are involved. Sensitivity calculated was 62% and Predictive Value Positive (PVP) was 37.2%. The representativeness of Lab based influenza surveillance system is poor as it is a sentinel surveillance with specific reporting sites strategically placed. Data from all sentinel sites is analyzed at national reference lab where it is summarized to use for planning and management purposes.

**Conclusions:** The system is meeting its objectives. Sustainability and stability of the system needs to be improved by allocation of public funds. Extension of the coverage of the system will result in improved representativeness. Regular capacity building of the staff at reporting site will ensure continued quality of reporting.

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## Abstract

# Measles Vaccine Effectiveness Among Children - Morocco - 2017

Fatima Zahra Benfouila; M Merabet; A Rguig; K Khatri; A Khattabi; F Meski

### Corresponding Author:

Fatima Zahra Benfouila

## Abstract

**Background:** Measles are one of the leading causes of vaccine-preventable death among young children in the worldwide. In Morocco, vaccination against measles has been introduced into the National Immunization Program (NIP) since 1987, as a single dose at nine months old. A second dose has been introduced since 2003 as part of the elimination strategy.

**Objective:** The of our work was to evaluate the vaccine effectiveness of measles vaccination after the first and the second dose among children aged between 12 and 60 months, from 2010 to 2016 in Morocco.

**Methods:** We conducted a test negative design using data from the measles surveillance system. Only children aged 12-60 months with laboratory result recorded was included. The vaccine status (unvaccinated, vaccinated one dose, vaccinated two doses) was defined among cases: children who had confirmed infection (presence of IgM specific antibodies for measles) and controls: children who had negative lab result (absence of IgM specific antibodies for measles). Vaccine effectiveness (VE) was estimated using the formula  $VE = [1 - \text{odds ratio (vaccinated/ unvaccinated)}] \times 100$ .

**Results:** In total 897 children were included from January 2010 to December 2016. The mean age was 36 months. The male female sex ratio was 0.8:1. According to the vaccination status, 785 were vaccinated, 79% of them have received one dose and 21% have received two doses. Lab result was positive for 186 (21%) of 897 patients. VE was 87% (CI 95%: 82%-93%) after one dose and 97% (CI 95%: 93%-99%) after two doses.

**Conclusions:** The field assessment of vaccination effectiveness confirms that measles vaccine is an effective way to prevent measles especially with two doses. The NIP should be reinforced by more vaccination campaign to cover all children who have not received the second dose.

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## Abstract

# Outbreak Investigation of Measles in Farash Town, Islamabad, April 2017

Nadia Noreen

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Nadia Noreen

## Abstract

**Background:** On April 14, 2017, two measles cases were reported by local health practitioner from Farash Town. A team of FELTP fellows were deputed to investigate the outbreak.

**Objective:** On the request of district health authorities an outbreak investigation was conducted to assess magnitude, identify risk factors and recommend control measures.

**Methods:** Outbreak investigation was carried out from April 18 to May 05, 2017. Active case finding was conducted through a house-to-house survey. A case was defined as onset of maculopapular rash with fever and presence of any of the sign/symptoms like coryza, conjunctivitis and cough in a resident of Farash Town from March 25, 2017 to April 30, 2017. Community-based age and sex-matched controls were selected. Vaccine coverage survey was conducted in a cluster of 245 houses. Frequencies were calculated, attack rates computed, and vaccine efficacy was determined. Blood samples of 03 suspected cases were sent to Public Health Laboratories at NIH Islamabad for confirmation.

**Results:** A total of 15 cases were identified; 13 through active case finding. Mean age was 44.5 months (range 05-120 months). The cases were predominantly male  $n=9$  (60%). Overall attack rate was 1.15% and most severely affected age group was 24-36 months ( $n=4$ ,  $AR=10.81\%$ ) followed by 12-24 months ( $n=3$ ,  $AR=8.10\%$ ). Diarrhea developed in  $n=12$  (80%) and pneumonia developed in  $n=2$  (13.3%). Immunization coverage survey showed that AR in unvaccinated was 25% and AR in vaccinated was 10%, hence the vaccine efficacy was calculated to be 60%. The most significant reason for non-vaccination was misconception about vaccination ( $OR: 24.0$ ,  $CI: 4.9-116.1$ ). All blood samples were positive for measles-specific IgM on ELISA.

**Conclusions:** Low immunization status was the most probable cause of outbreak. The results were communicated to district health authorities for mass vaccination. Health awareness session was conducted for all households. No new case was reported during the two weeks follow-up.

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Abstract

# Suspected Chikungunya Outbreak Investigation, District Gwadar Baluchistan Pakistan March 2017

Abdul Sami Khan; A Saeed

**Corresponding Author:**

Abdul Sami Khan

## Abstract

**Background:** District Health Officer Gwadar reported chikungunya cases to Provincial Disease Surveillance and Response Unit Quetta and requested for an epidemiological field investigation.

**Objective:** A team sent to confirm, investigate and suggest control measures on 17th March 2017.

**Methods:** A case was defined as a resident of District Gwadar with history of fever with joints pain within last 03 months (January - March 2017). Active case finding was done from 18th to 24th March 2017. Public and private health facilities were visited to review their records. water storage and sanitation practices for vector identification were assessed.

**Results:** 684 patients were identified (over all attack rate = 0.25%). 29 blood samples collected and sent to NIH Islamabad, 72% (n=21) were Chikungunya positive. Among patients 50% (n=344) were male and 50% (n=340) females. Mean age was 27 years (range=1-70 years). Most affected age group was 15 to 19 years (14.6%, n=100), 20 to 24 years (13%, n=92), 25 to 29 years (11%, n=76) and 35 to 39 years (9% n=59) with attack rates 0.35%, 0.38%, 0.38%, and 0.45% respectively. 56% (n=382) patients were from Gwadar, 23% (n=161) from Jewani and 21% (n=141) from Pasni with attack rates 0.37%, 0.41% and 0.14% respectively. Investigation revealed that first case was reported on 4th Jan-2017. Being an emerging disease there is lack of knowledge about this disease, its prevention and control among health care providers and community. Sanitation/water storage practices were very poor, larvae of vector also isolated during house hold survey.

**Conclusions:** Lack of proper sanitation and storage techniques in combination of warmer temperature of this coastal district are most probable causes of outbreak. Awareness sessions among community, district administration and healthcare providers regarding chikungunya, its prevention and control were conducted along with vector control on immediate basis through fogging of reservoirs and internal residual spray (IRS). Surveillance system established for regular reporting.

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Abstract

# An Outbreak Investigation of Chikungunya Fever -District Tharparkar, Pakistan, August 2017

Bisma Memon; S Hussain; A Khaskheli; N Masood

**Corresponding Author:**

Bisma Memon

## Abstract

**Background:** On 8th August 2017 print media reported 49 cases of fever with severe joint pains from different villages of District Tharparkar. On the same day a team of FELTP fellows was deputed to investigate the situation.

**Objective:** The objectives of the investigation were to determine the extent of outbreak, evaluate the risk factors and suggest recommendation for control.

**Methods:** A descriptive followed by age and sex-matched case-control study was conducted in District Tharparkar in August 2017. Review of reported cases and active case finding was conducted. A case was defined as acute onset of fever (102°F) and severe arthralgia or arthritis not explained by other medical conditions, in a resident of District Tharparkar from 13 July to 27 August 2017. A structured questionnaire was used to collect the information. Blood samples were sent to National Institute of Health for confirmation RT-PCR. An entomological survey was conducted in the affected area. Frequencies were calculated, attack rates computed, and multivariate analysis undertaken at 95% confidence interval and a 5% margin of error.

**Results:** A total of 204 cases were identified, 155 through active case search. Mean age was 25.5 years (range 01 month - 80 years) with a female preponderance (n=112; attack rate (AR) 54%). The overall AR was 26.7/1000, with 20-29 years being the most severely affected age group (AR 33/1000). Presence of uncovered water containers was significantly associated with disease (OR=10.4, 95% CI= 6.54-16.6). Use of bed nets had a protective effect. Out of 48 samples sent, 34 were positive on RT-PCR. Entomological Survey revealed house index 79.3%, container index 40.6% and breteau index 182%.

**Conclusions:** Presence of uncovered water containers in the house were potential breeding sites for the vector and was the most probable cause of the outbreak. Indoor residual spray followed by fogging and community awareness were conducted.

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Abstract

# Effectiveness of Previous Mumps Vaccination During the 2014-2015 Outbreak in Lebanon

Nadine Haddad; H Abou Naja; S Kassouf; A Paez Jimenez; G Abou Mrad; W Ammar; N Ghosn

**Corresponding Author:**

Nadine Haddad

## Abstract

**Background:** In Lebanon, MMR was introduced at 12 months and 4-5 years in 1996. In 2014, the 2nd MMR dose was shifted to 18 months with 79% coverage; a six-fold increase in mumps national incidence was observed in December.

**Objective:** This study aims to determine mumps vaccine effectiveness (VE) among Lebanese population to guide immunization policies.

**Methods:** Clinical and confirmed mumps cases reported to Epidemiological Surveillance Program between 2014W46 and 2015W11 were eligible if Lebanese and aged 1.5 to 19 years-old. They were matched 1:1 on age and locality to randomly selected controls using phonebook of the same area. Information was collected by structured phone interviews. Mumps vaccination status was based on documented valid dates for MMR doses. Data were entered using Epidata 3 and analyzed using Stata13. VE [(1-OR) x 100] of one and two doses and ORs (95% CI) for acquiring mumps were estimated using conditional logistic regression.

**Results:** 91 cases and 91 controls were included. Only 36% of cases had vaccination cards, compared to 71% of controls ( $P < 0.001$ ), and 94% of cases were not vaccinated compared to 51% of controls ( $P < 0.001$ ). Vaccine effectiveness was estimated 60% (CI -27%: 88%) for one dose and 88% (CI 60%: 96%) for 2 doses.

**Conclusions:** Two-doses of MMR vaccine were estimated as 88% effective against mumps, similar to results found in the literature. Suboptimal MMR2 coverage can explain this outbreak. Efforts should focus on achieving high MMR coverage and raising population's awareness about preserving documentation of vaccination.

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Abstract

# Investigation of Dengue Fever Outbreak- District Peshawar, Pakistan, September 2017

Asim Minallah; A Baig; N Azam

**Corresponding Author:**

Asim Minallah

## Abstract

**Background:** About 50 to 100 million people get infected with Dengue every year. Since 2003, Pakistan has seen multiple outbreaks with biggest one in 2011 in Lahore involving 22,000 cases. From August 6 to September 16, 2017, 112 Dengue fever cases were reported to a hospital in town X of District Peshawar.

**Objective:** A case-control study was conducted to assess the magnitude of the disease, evaluate risk factors and recommend control measures.

**Methods:** A desk review of available records and active case finding was conducted. A case was defined as fever of  $>38^{\circ}\text{C}$  for 2 to 10 days with minimum two of the following; headache, rash, retro-orbital pain, myalgia and bleeding in a resident of town X from July 24 to September 21, 2017 and a positive NS-1 test. Age and sex-matched controls were identified from the same locality. A structured questionnaire was used to collect information about cases and controls. Frequencies were calculated, attack rates computed, and odd ratios determined at 95% confidence interval with p value  $<0.05$ .

**Results:** A total of 140 cases were identified (28 cases through active case finding) with mean age of 28.9 years (range 8-55 years). Male to female ratio was 8:1 with an overall attack rate of 9.3%. The most affected age group was 21-30 years (AR=15.1%). Out of 140 cases, 88 had open water containers in the house (OR=3.9, 95% CI=2.5-6.0) and 84 had larvae present in their households (OR=2.5, 95% CI=1.6-3.8). Regular use of repellents and screened doors and windows showed to have a protective effect.

**Conclusions:** Presence of open water containers inside the house served as breeding grounds for the vector and were the most probable cause of the outbreak. Regular use of repellents was shown to be protective. Local breeding sites were destroyed, and residents were educated about the risk factors and protective measures.

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## Abstract

# Potential Impact and Cost-Effectiveness of Rotavirus Vaccination in Afghanistan

Palwasha Anwari; F Debellut; C Pecenka; S Mohammed; A Clark; D Groman; N Safi

### Corresponding Author:

Palwasha Anwari

## Abstract

**Background:** Despite progress made in child survival in the past 20 years, 5.9 million children under five years died in 2015, with 9% of these deaths due to diarrhea. Rotavirus is responsible for more than a third of diarrhea deaths. In 2013, rotavirus was estimated to cause 215,000 deaths among children under five years, including 89,000 in Asia. As of April 2017, 92 countries worldwide have introduced rotavirus vaccination in their national immunization program. Afghanistan has applied for Gavi support to introduce rotavirus vaccination nationally.

**Objective:** This study estimates the potential impact and cost-effectiveness of a national rotavirus immunization program in Afghanistan.

**Methods:** This study examined the use of Rotarix (RV1) administered using a two-dose schedule at 6 and 10 weeks of age. We used the ProVac Initiative's UNIVAC model (version 1.2.09) to evaluate the impact and cost-effectiveness of a rotavirus vaccine program compared with no vaccine over ten birth cohorts from 2017 to 2026 with a 3% annual discount rate. All monetary units are adjusted to 2017 US\$.

**Results:** Rotavirus vaccination in Afghanistan has the potential to avert more than one million cases; 660,000 outpatient visits; approximately 50,000 hospital admissions; 650,000 DALYs; and 12,000 deaths, over 10 years. Not accounting for any Gavi subsidy, rotavirus vaccination can avert DALYs at US\$82/DALY from the government perspective and US\$80/DALY from the societal perspective. With Gavi support, DALYs can be averted at US\$29/DALY and US\$31/DALY from the societal and government perspective, respectively. The average yearly cost of a rotavirus vaccination program would represent 2.8% of the total immunization budget expected in 2017 and 0.1% of total health expenditure.

**Conclusions:** The introduction of rotavirus vaccination would be highly cost-effective in Afghanistan, and even more so with a Gavi subsidy.

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## Abstract

# Outbreak Investigation of Dengue Fever in Water Scarce District Tharparkar of Pakistan, 2016

Sandeep Mehraj; N Masood

### Corresponding Author:

Sandeep Mehraj

## Abstract

**Background:** On 8th December 2016, 43 cases of dengue fever were reported from Tharparkar to Director General Health Office. The very next day FELTP fellows were assigned to investigate the outbreak.

**Objective:** Objectives were to assess the magnitude, evaluate the risk factors and recommend control measures.

**Methods:** Review of hospital records and active case finding was done. A descriptive followed by a case control study was conducted in December 2016. A case was defined as acute fever more than 102°F lasting >3 days, plus a positive NS-1 test in a resident of Tharparkar during September to December 2016. During entomological survey objects containing water were sampled and investigated for presence of larvae or pupa. The collected vectors were examined for species identification.

**Results:** A total of 254 cases were identified (211 by active case finding) with 73% males. Overall attack rate (AR) was 0.02 with 10-14 years being the most affected age group (AR=0.03). Out of 254 cases, 79% (n=201) had indoor water receptacles (OR 32, CI 19.6-54 with  $P<0.00$ ), 61% (n=155) had potted plants inside the house (OR 8, CI 5-13, p value < 0.00), and 46% (n=118) had outdoor water receptacles (OR 3, CI 2-4 with p value < 0.00) whereas intact window nets 52% of cases (n=132) (OR 0.44, CI 0.02-0.08, P value < 0.00) were found protective against getting the dengue infection. Total 2616 Aedes larvae-(58.3 per dip) and 423 pupae-(8 per dip) were collected by 320 dips. Among 152 houses 182 breeding sites were identified. Adult Aedes were found in 12 of 230 rooms.

**Conclusions:** The outbreak was likely caused by presence of vector breeding sites inside and outside the house. On the recommendation of the study, health authorities initiated health awareness sessions and promoted mechanical control of breeding sites as well as use of windows net.

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## Abstract

# Outbreak Investigation of Dengue Fever in District Malir, Karachi, Sindh, Pakistan, 2015

Jamshed Khan

## Corresponding Author:

Jamshed Khan

## Abstract

**Background:** Dengue fever is an acute arboviral disease transmitted to humans by bite of mosquito genus *Aedes*. On September 13, 2015, private hospital reported cluster of 19 suspected dengue cases from district Malir. In response to this, we initiated an epidemiological and entomological investigation.

**Objective:** To know magnitude, risk factors, Contain and suggest recommendations.

**Methods:** Descriptive followed by case-control study was carried-out Age- and sex-matched controls were taken with a ratio of 1:2. World Health Organization standard case definition was used to identify suspected and confirmed cases. Active case finding done in health facilities and in community from September 14 to November 10, 2015. Data were analyzed using Epi Info version 7.0. Bivariate analysis done on 95% Confidence interval with 5% margin of error. Blood was collected for confirmation. Entomological surveillance was carried out.

**Results:** One hundred five cases identified, and two deaths reported. CFR=1.9%). Eighty-three (79%) were males with attack rate 1.5/1000. Mean age for cases was 26 years (range: 7-84 years). Most affected age group was 21-30 years n=42; 40% with attack rate (2.4/1000). Over all attack rate was 0.9/1000. Uncovered fresh water reservoir around and the house (OR 6.9; 95% CI: 2.9-11.32;  $P<0.05$ ) non-usage of repellents (OR 3.0; 95% CI: 1.36-3.7;  $P<0.05$ ), absence of window screens (OR 9.5; 95% CI 6.4-24.3;  $P<0.05$ ) were statistically significant associations. All cases were confirmed on ELISA and NS1 Antigen. Adult misquotes inside the homes, while Larva and pupa detected in storage fresh water.

**Conclusions:** Stagnant of fresh water in and around domestic premises and not using of repellents in homes and larvicides were most probable causes of this outbreak. Failure to implement mosquito preventive control measures may have contributed to this outbreak. Establishment of isolation wards, Mass awareness, distribution of bed nets, spraying mosquito insecticide and fogging contributed to control outbreak.

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Abstract

# Outbreak Investigation of Cutaneous Leishmaniasis (CL) in North Waziristan Agency, Federally Administered Tribal Area (FATA) - April 2016

Inayatullah Rehman; M Saleem

**Corresponding Author:**

Inayatullah Rehman

## Abstract

**Background:** On 4th April 2016, community representative from village Spinwam, North Waziristan reported 39 suspected cases of Cutaneous Leishmaniasis. FELTP Fellow and N-STOP Officer North Waziristan attached to Political Agent Office North Waziristan was tasked to visit the affected area and carry out necessary investigations.

**Objective:** The objectives were to identify any additional cases, associated risk factors and recommendation for control.

**Methods:** A case was defined as a resident of Tehsil Spinwam with one or more papular, nodular or ulcerative lesions on the skin after history of sand fly bite from February 2016 to April 2016. Hospital records were reviewed, patients and health staff were interviewed, and suspected sites visited. A case control study was conducted with one control for each case.

**Results:** Sixty-seven cases were identified (58 clinically and 9 by microscope). Male to female ratio was 1:2. Median age: 10 years (1-60 years). The Epi curves shows intermittent source of infection. Risk factor analysis showed that private gardens (OR=1.95, 95% CI=1.11-3.26; p-value<0.05), stagnant water-body (OR=1.84, 95% CI=1.08-3.13; p-value<0.05) and not using mosquito-protective measures (OR=36.11, 95% CI=16.8-77.5; p-value<0.05) were significantly associated with the illness. Use of bed nets (OR=0.05, 95% CI=0.02-0.12; p-value<0.05) and mosquitoes repellents (OR=0.05, 95% CI=0.02-0.12; p-value<0.05) were negatively associated with the illness.

**Conclusions:** The area is bordering with Afghanistan and index case had a travel history from Afghanistan four months before appearance of his lesion. He left it untreated allowing the parasite to be transmitted to the indigenous sandflies and subsequently resulted in an outbreak. Based on results existing surveillance system for Leishmaniasis was strengthened, indoor residual spray and fumigation for vector control carried out, bed nets and insect repellants provision were ensured. Injection Glucontine was arranged. Regular awareness sessions were recommended. During the 04-month follow up period 32 cases were reported who had sand fly-bite histories of longer than 05 months.

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Abstract

# Epidemiological Determinants Associated with the Spread of Dengue Fever in Lahore, Punjab -2013

Fawad Khurshid

**Corresponding Author:**

Fawad Khurshid

## Abstract

**Background:** Dengue is the most rapidly spreading mosquito-borne viral disease in the world. It is one of the important public health emergencies of international concern as per International Health Regulations (IHR). In Punjab the disease suddenly saw an upsurge towards August 2011 especially in Lahore and adjoining areas of Punjab. By 2011, total of 20864 cases of Dengue had been reported in the province, including 17256 in Lahore alone. A large number of these cases i.e. 21292 in Punjab including 17232 in Lahore only were cured while a total of 352 deaths including 279 in Lahore were reported. Apart from Lahore, maximum number of cases have been reported from Faisalabad (783), followed by Rawalpindi (410), Pakpattan (233) and Sheikhupura (225).

**Objective:** To identify epidemiological determinants responsible for causation of Dengue for preventing future outbreaks in the study area particularly and in Punjab in general.

**Methods:** A case control study was conducted in December 2013 to identify the epidemiological determinants for spread of Dengue Fever. Cases were those confirmed with IgM/IgG positive (n=147) living in Data Ganjbaksh town Lahore and controls (n=300) were selected from the same area who were suspected cases with laboratory negative results. A standardized questionnaire was developed to collect data. A line list of cases was developed, and data was analyzed using Epi Info version 7.0

**Results:** Variables found significant in the bivariate analysis were included in a logistic regression analysis. The presence of indoor stagnant water (OR 3.7), indoor larvae (OR 3.1), not using repellent (OR 2.7), and older age (OR 1.2) were independent determinants of dengue infection ( $P<0.01$  for all).

**Conclusions:** Health education campaigns for improved water storage practices. Indoor residual sprays in urban and peri-urban high-risk areas 1 month before the transmission period. Community based environmental management was recommended.

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Abstract

# Descriptive Analysis of Malaria Surveillance System Data, Yemen, 2011-2015

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Labiba Anam**Corresponding Author:**

Labiba Anam

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**Abstract**

**Background:** Malaria remains one of the most serious health problems in Yemen where 68% of population is living in malaria risk areas. An Integrated Malaria Surveillance System (IMSS) was introduced in 2009 to improve reporting.

**Objective:** To describe the epidemiology of malaria and identify groups at risk.

**Methods:** Data for 2011-2015 was obtained from the National Malaria Control Program (NMCP). According to the NMCP Guidelines, confirmed malaria case is defined as a case that is positive by microscopy or rapid test. We calculated incidence rate (IR) by age group, sex, type of plasmodium, seasonality and population at risk using projections from the 2014 Central Statistical Organization data.

**Results:** Although the overall malaria IR dropped from 11/1000 in 2011 to 5 in 2015, the IR among < 5 children increased from 8 to 15/1000 and the percentage of confirmed cases increased from 0.64% to 0.83%. Among pregnant women, the IR increased from 4/1000 in 2011 to 6 in 2014 but decreased to 2 in 2015. Two thirds of malaria cases were reported among males and from the coastal governorates. Plasmodium Falciparum accounted for 99% of cases.

**Conclusions:** Despite IR dropped from 2011 to 2015, such drop might not reflect improvement in control and prevention measures, but could reflect underreporting due to political instability, war situation and poor access to health facilities. Proper targeting especially of coastal areas by insecticide treated bed nets and indoor residual spraying is necessary. Strengthening of surveillance system for high-risk groups i.e. <5 children and pregnant women is recommended. A qualitative research should investigate reasons behind the predominance of malaria among males. Further IMSS evaluation is recommended.

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## Abstract

# Investigation of Malaria Outbreak in Aswan, Egypt, 2014

Manar Keshk; S Elshourbagy; M Genedy; A Kandeel

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Manar Keshk

## Abstract

**Background:** On May 26th 2014, new malaria cases were reported from Aswan in upper Egypt to the ministry of health and population (MOHP) through the national surveillance system(NEDSS), with no history of travel to a malaria-endemic country. MOHP interfered with a rapid response team(RRT) to investigate and contain any suspected outbreak. Efforts were concentrated on active-case finding, laboratory testing, entomological surveillance, proper treatment of patients and health education

**Objective:** To investigate and contain any suspected outbreak.

**Methods:** Field investigation in the affected village and its surrounding 15 villages. started on May 28th,2014 after confirmation of the first case. The RRT used a standardized case definition and distributed it to all hospitals and health unites in Aswan. Cases were diagnosed clinically, and laboratory confirmed. Active case finding was done. Investigation continued till June 19th till no additional cases were reported.

**Results:** A total of 319 suspected cases at Edfu Fever Hospital; about 14,696 samples examined during active case-finding; where 4 samples proved positive and were transferred to Edfu Fever Hospital to receive proper treatment. A total of 22 cases were confirmed for malaria, all were caused by *P. vivax*. The median age of patients was 19 (range 6-90 years), with male: female ratio 1:1. No complications or deaths were reported. All cases were discharged after full recovery and after performing 4 blood films all of which are negative for plasmodia. The first onset of symptoms occurred on May 20th 2014 and the final case revealed symptoms on the 15th of June 2014.

**Conclusions:** The Egyptian MoHP succeeded in early detection and rapid containment of a new focus of re-emerged malaria cases at a village in Upper Egypt through intensive malaria control procedures. Malaria Surveillance should be continued and reinforced for early detection of future outbreaks

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## Abstract

# Prevalence of Brucellosis in Sindh Pakistan

Om Parkash Suthar; M Athar; M Aamir; T Ghafoor

### Corresponding Author:

Om Parkash Suthar

## Abstract

**Background:** Brucellosis is a bacterial disease caused by genus brucella. Bovine brucellosis affects cattle, sheep & goats, camels, equines, dogs and may also infects other animals. The disease in animals is characterized by abortion in last trimester and reproductive failure. All ages of cattle are susceptible, and infection can last for many years. Infected males develop epididymitis, orchitis and testicular abscesses. In humans, brucellosis can be caused by *B. abortus*, *B. melitensis*, *B. suis* (biovars 1-4) and rarely *B. canis*. The major losses caused by brucellosis are; decreased milk production, weight loss, calf mortality, infertility and lameness.

**Objective:** To identify the animals infected with brucellosis in selected districts and to develop disease control and mitigation measures of brucellosis.

**Methods:** The present study was aimed to determine the prevalence of brucellosis in cattle with reproductive disorders, randomly selected cattle, cross breed cattle and small ruminants (sheep and goat) in eight districts of Sindh by Milk Ring Test (MRT), Rose Bengal Plate Test (RBPT) and Indirect ELISA.

**Results:** A total of 4559 animals with reproductive disorders (4225 female and 334 male) were screened. The prevalence was found 25.16% in female cattle while 27.84% in male cattle. A total of 6390 randomly selected animals (6248 female and 142 male) were screened. The prevalence was found to be 10.57% in female cattle while 21.12% in male cattle. The 1002 samples were screened from cross breed cattle, the prevalence was 25.54%. A total of 1639 samples were screened from sheep and goat. The prevalence was found to be 14.46%.

**Conclusions:** It was concluded from the present study that brucellosis is endemic in Sindh, therefore the prevention of brucellosis with vaccination is best policy for the control of the disease.

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Abstract

# Surveillance and Molecular Epidemiology of Avian Influenza H9N2 Viruses Circulating in Pakistan

Muhammad Farooq Tahir

**Corresponding Author:**  
Muhammad Farooq Tahir

## Abstract

**Background:** Avian influenza H9N2 is highly endemic in commercial and backyard poultry in Pakistan. Its widespread circulation and high mutation rates provide a possibility of novel reassorted viruses hence posing a serious public health threat.

**Objective:** This study was aimed to isolate and evaluate the AI H9N2 viruses circulating in poultry as well as aquatic birds in Pakistan between 2014 and 2017.

**Methods:** Specimens were collected from morbid or dead birds suspected for AI H9N2 on the basis of clinical signs or post-mortem lesions brought to five poultry diagnostic laboratories in Punjab. The samples were subjected for virus isolation. The isolates then were confirmed for H and N type using PCR. Six isolates were subjected to phylogenetic analysis of Haemagglutinin gene. The results were compared with isolate reported previously from Pakistan and other regional countries for homology.

**Results:** 129,622 samples from 7481 poultry flocks were processed, 5.3% (399/7481) were positive for AIV H9N2. Sequence analysis showed that it had homology of 84-93% with different regional strains. Changes were seen at 24 different sites and at cleavage site at K148R and I151R in comparison to previous Pakistani isolates. Six possible glycosylation sites were observed. Neighbor joining phylogenetic tree confirmed its 93.4% homology with the isolate of Iran. The isolates were the same clade as other regional isolates and have common ancestors.

**Conclusions:** The prevailing H9N2 viruses in Pakistan have certain markers and elements in the HA gene that may improve its avian to human transmission. Continuous surveillance of influenza A viruses is necessary to monitor their antigenic determinants. Protocols for the AI surveillance have officially been notified by Department of Livestock & Dairy Development Department, Punjab as a result of these findings.

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Abstract

# Outbreak Investigation of Malaria in Usta Mohammad, District Jaffarabad

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Waheed Ahmed**Corresponding Author:**

Waheed Ahmed

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**Abstract**

**Background:** On 7 August 2017, District Health office received information about 2 deaths due to high grade fever at Usta Mohammad. 7 similar cases were also reported from same village.

**Objective:** Descriptive followed by Case Control study was conducted to investigate outbreak and to assess risk factors

**Methods:** Descriptive followed by Case Control study was conducted to investigate outbreak and to assess risk factors. Case was defined any person resident of Usta Mohammad, regardless of age and sex, having fever with chills with August 7th August to 26th September 2017. Review of hospital records and active case finding was done through house to house survey. Matched for Age and sex controls were taken from locality with a ratio of 1:2 and interviewed. Blood samples were taken for microscopy and rapid diagnostic tests. Data were analyzed using EpiI nfo version 7.0.

**Results:** 180 cases identified with mean age of 22.5 years (range: 01-60). Males were 59%. Age group 1-20 years was most affected (n=59). All cases were confirmed on microscopy and 90% (n=162) were positive on rapid test. Plasmodium falciparum was positive in 35% (n=64) while rest were positive for Plasmodium vivax. Attack rate was 31.4%. Case fatality was 12%. Spot map shows clustering around a stagnant Pond water. Epi curve shows sudden outburst of cases on 23th of September 2017. statistical associations was found between disease occurrence and following risk factors; Stagnant water pond (OR 48.23, 95% CI 4.43-31.27;  $P<0.05$ ), non-usage of repellents (OR 5.3, 95% CI:2.67-13.52;  $P<0.05$ ), absence of window screens (OR 11.2, 95% CI 5.44-41.12;  $P<0.05$ ), absence of insecticide spray (OR 4.22, 95% CI 6.76-183.72;  $P<0.05$ ) and waste dump near houses (OR 7.2, 95% CI 4.91-33.41;  $P<0.05$ ).

**Conclusions:** Stagnant Pond water was major mosquito breeding site and probable cause of outbreak. Mass awareness, Residual sprays, pond treatment by larvicidal, provision of bed nets and prophylaxis with chloroquine were able to control the outbreak.

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## Abstract

# Descriptive Analysis of Suspected Crimean-Congo Haemorrhagic Fever (CCHF) Cases in Isolation Ward of Public Sector Hospital, Quetta from March-August 2017

Farida Khudaidad; A Saeed

## Corresponding Author:

Farida Khudaidad

## Abstract

**Background:** CCHF cases from Balochistan and Afghanistan are referred to isolation ward in Quetta. CCHF is endemic to Balochistan but still there is no established surveillance system in province and no tick bite reporting system. The main objective was to determine the means of transmission and the epidemiologic characteristics of disease.

**Objective:** Describe the Epidemiology of CCHF and analyze the situation of health facility.

**Methods:** A descriptive study was carried out in the CCHF isolation ward in Quetta from March-August 2017. Using standardized case definition, all patients admitted in Isolation ward with clinical evidence of CCHF were included in the study. After taking informed consent, data was collected on demographic factors, history of animal contact, tick bite history, co morbidity, laboratory results and treatment outcome. Means and percentages were calculated.

**Results:** During the study period, 51 suspected CCHF patients were admitted in Isolation ward, 38 (74.5%) males were affected. Mean age of the cases was 30 years (range 02-75years). Most affected 16 (31%) age group was 21-30 years. Forty-eight (94%) cases had history of animal contact and 44 (86%) with tick bite. Majority of cases 42 (82%) were reported from May -August. 30 patients in study were tested by PCR, 16 (53.3%) were positive, out of which 5 (31%) expired. It is only isolation ward in whole province with 2 doctors, 2 nurses & 1 paramedic. Proper Personal protective equipment was not available. No Laboratory was available for immediate investigations.

**Conclusions:** Given the overall results important risk factors for CCHF are history of tick bite, high-risk occupations and having contact with livestock. Public health measures should focus on preventing tick bites, increasing awareness of CCHF signs and symptoms, adopting hospital infection control practices, timely investigation & treatment to reduce mortality. Government should set up isolation units in all Major hospitals with proper surveillance system in Province.

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## Abstract

# Outbreak of Cutaneous Anthrax in Kalukhali Upazilla, Rajbari District, Bangladesh 2017

Faisol Talukdar; M Sabrina; R Sultana; M Sazzad

### Corresponding Author:

Faisol Talukdar

## Abstract

**Background:** Anthrax is endemic and human infection has been identified in 15 of 64 districts of Bangladesh. Outbreak are associated with exposure to infected animals during droughts, floods or soil disturbances. On September 6, 2017 the civil surgeon of Rajbari District, reported six people with anthrax like lesions with exposure to one sick cow.

**Objective:** We investigated to determine cause of outbreak, describe the epidemiological and clinical features of cases, and to control the outbreak.

**Methods:** We selected cutaneous anthrax cases among the people presented with painless skin lesion including papular, vesicular and depressed black eschar living in Kalukhali, Rajbarj from 27th August to 09th September 2017. Human cases exposure with sick cow identified by contract tracing. We interviewed the suspected cases for clinical symptoms and types of exposure. We collected skin swabs from 5 humans and meat from the slaughtered sick cow and tested these samples by RT-PCR.

**Results:** We found 11 cases from community by contract tracing and 6 cases from medical record. Most (71%) cases were male; median age of cases was 30 years. Among the cases, five females cleaned meat, nine males butchered the animal, and three males carried the meat. Most (59%) cutaneous lesions were found on hands. The cattle became sick after eating of Kolmi shak (water spinach) from a nearby flooded area. Cutaneous symptoms developed in 1 to 9 days (median 5 days). *Bacillus anthracis* was positive by PCR in one cattle meat sample and one human swab sample.

**Conclusions:** This was the first reported anthrax outbreak in the Rajbari district. To control this outbreak, all the cattle in the village were vaccinated and an awareness program to avoid slaughtering of sick cattle was conducted. To prevent future outbreaks, anthrax vaccination of ruminants should be conducted yearly, and priority should be given in the flood affected district.

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## Abstract

# Prevalence and Antimicrobial Susceptibility Patterns of Salmonella Enteritidis and Salmonella Typhimurium Isolates from Commercial Poultry in Punjab, Pakistan

Muhammad Farooq Tahir; F Afzal; M Athar

## Corresponding Author:

Muhammad Farooq Tahir

## Abstract

**Background:** Non-typhoid salmonella infections are one of the leading food borne infections worldwide. Similarly, ever increasing antimicrobial resistance has become a major problem to animal as well as human health worldwide. Poultry being the single largest animal protein source in Pakistan is one of the major suspects for both these public health concerns.

**Objective:** This study was aimed to determine the prevalence of Salmonella Enteritidis and Salmonella Typhimurium in commercial poultry flocks of Punjab and to evaluate their antimicrobial susceptibility patterns.

**Methods:** Specimens were collected from morbid or dead birds suspected for salmonella infection on the basis of clinical signs or post-mortem lesions brought to five poultry diagnostic laboratories in Punjab between 2014 and 2017. The samples were then processed for bacterial isolation and molecular confirmation through PCR. The isolates were then subjected to antibiotic sensitivity test using disc diffusion method. The susceptibility was determined using CLSI guidelines for antimicrobial susceptibility testing. The frequencies and percentages were calculated using Epi info.

**Results:** A total of 28150 samples were processed, among them 1.04% (294/28150) were positive. 89.5% (263/294) of the isolates were Salmonella Enteritidis while 10.5% (31/294) were Salmonella Typhimurium. The isolates were most sensitive to Ciprofloxacin and least to doxycycline with 96% (273/294) and 56% (166/294) response rates respectively. 7.8% (23/294) of the isolates were found to be resistant to three or more antibiotics. For other drugs the sensitivity percentages were Gentamicin 86% (254/294), Enrofloxacin 82% (241/294), Amoxicillin 77% (227/294), Norfloxacin 74% (219/294), Colistin 71% (208/294) and Neomycin 67% (197/294).

**Conclusions:** Salmonella isolates were found more sensitive to Ciprofloxacin, followed by Gentamicin, Enrofloxacin and Amoxicillin while the isolates were least sensitive to Doxycycline.

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## Abstract

# Outbreak of Brucellosis Among Workers of Cattle Dairy Farm at Renala Khurd- District Okara, Pakistan, January 2017

Saima Dil; Z Hayat; A Abbass

### Corresponding Author:

Saima Dil

## Abstract

**Background:** Brucellosis is endemic in Pakistan and poses a great challenge owing to nonspecific clinical manifestations. On 7th January 2017 three workers of cattle dairy farm at Renala Khurd reported to have intermittent fever.

**Objective:** A team was sent on 8th January 2017 to estimate magnitude of outbreak, evaluate risk factors and recommend control measures.

**Methods:** A case was defined as prolonged intermittent fever, profuse night sweats and headache in a worker of cattle dairy farm at Renala Khurd from 7th to 21st January 2017. Cases and controls were matched by age and locality (1:4). Epidemiological information was recorded on a questionnaire. Serological testing was conducted using Rose Bengal plate test & iELISA. Frequencies were calculated, odd ratios determined at 95% confidence interval with p value less than 0.05.

**Results:** A total of 9 cases were identified and mean age was 30 year (range 24-42 years). Overall attack rate was 29% and attack rate in cattle attendant was 47%. Among cases 78% (7/9) were involved in milking, feeding, cleaning, 44% (4/9) were habitual consumers of raw milk while 22% (2/9) were drivers and watchmen. Persons consuming contaminated raw milk (OR: 10; 95% CI: 1.4-70.2;  $P=0.024$ ) and workers having direct contact with animals (OR: 8.3; 95% CL: 1.4-49;  $P=0.01$ ) were more likely to have brucellosis. Apart from intermittent fever, night sweats (88%), headache (88%), fatigue (44%) and backache (11%) were the most frequent symptoms. All 9 cases were positive for brucella antibodies.

**Conclusions:** The most probable cause of this outbreak was consumption of unprocessed contaminated milk and contact with secretions/excretions of infected animals. Monthly screening of workers, for a period of six months was recommended. Human cases were referred for medical treatment and Department of Health was notified.

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Abstract

# An Outbreak of Brucellosis in Cattle dairy farm, District Okara, Pakistan - January 2017

Saima Dil; A Abbass

**Corresponding Author:**

Saima Dil

## Abstract

**Background:** Brucellosis is prevalent in livestock causing huge economic losses due to loss of production. On January 4, 2017, six abortions at third trimester of gestation were reported from a cattle dairy farm at Renalakhurd, District Okara.

**Objective:** An Outbreak investigation was initiated to assess the magnitude, identify risk factors and recommend control measures.

**Methods:** A case-control study was conducted. A case was defined as adult cow in the affected dairy farm aborting at third trimester, without fever, from 18th December 2016 to 7th January 2017. Age-matched controls were selected from the same farm (1:4). Semen doses used for insemination, were tested by molecular and culturing technique. Serological testing was done through RBPT and i-ELISA. Frequencies were calculated, odd ratios determined calculated at 95% confidence interval with p value less than 0.05.

**Results:** A total of 49 pregnant cows were identified and 16 of them had aborted at 3rd trimester. The age ranged from 5-7 year (median=5 year). For the 16 cases attack rate was 33% for aborting cows, 24% for close contact cows. The aborting cows were more likely to have brucellosis (OR 35, 95% CI 7-175,  $P=0.00$ ) as compared to non-aborting cows and close contact cows were more likely to have brucellosis (OR 5, 95% CI 1.4-16,  $P=0.017$ ) as compared to cows from other sheds. A total of 18.4% (23/125) farm cattle were found infected with brucellosis on serological testing. Brucellae were not detected in semen doses. Index case was a newly added (2 month before) exotic cow that was not screened by RBPT neither quarantined.

**Conclusions:** Infected exotic cow was the most probable cause of the outbreak. Healthy animals got infection by licking aborted fetus or vaginal secretions of aborting cow. Vaccination of eligible calves using strain 19, culling of confirmed cases, isolation of pregnant cows, screening & quarantine of newly purchased animals was recommended.

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## Abstract

# Assessment of Water, Sanitation and Hygiene (WASH) within Healthcare Facilities in Selected Eastern Mediterranean Countries

Adel Al-Rawahneh; M Rawahneh; Y Khader

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Adel Al-Rawahneh

## Abstract

**Background:** Inadequate drinking water, sanitation, and hygiene (WASH) in health care facilities impacts the health, particularly in low and middle-income countries. There is limited knowledge on the status of WASH in such settings.

**Objective:** The primary objective of this study was to assess WASH conditions in health care facilities in four EM countries; Jordan, Morocco, Lebanon, and Pakistan.

**Methods:** This study was based on secondary data analysis of the regional study on WASH services in health facilities. Separate samples of health care facilities were selected from Jordan (19 hospitals), Morocco (8 hospitals), Lebanon (14 hospitals), and Pakistan (8 hospitals) and were assessed using the WHO/CEHA tool WSH in the health facilities assessment tool. The assessment tool consisted of items to assess the WSH services availability, adequacy, and functionality.

**Results:** All health care facilities (100%) in Jordan and Morocco, 71.4% of hospitals in Lebanon and none of the hospitals in Pakistan had a safe water source. Overall, all hospitals in Jordan, Morocco, and Lebanon and 71.4 % of hospitals in Pakistan had improved and gender separated toilets in inpatients settings (One per 20 users). About 84.2% of hospitals in Jordan, none in Morocco, 28.6% in Lebanon, and all hospitals in Pakistan had sufficient improved and gender separated toilets in outpatients setting. Overall, 84.2% of hospitals had sufficient and functioning handwashing basins with soap and water and 79.0% of hospitals had sufficient showers. The majority of hospitals in the selected countries have a policy for the safe management of healthcare waste but inadequate training program on healthcare waste.

**Conclusions:** WASH services are not well implemented in health care facilities of the selected countries. The countries have to develop and implement a monitoring system for WASH services or at least support inclusion of WASH services in routine monitoring of health care services.

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## Abstract

# Enforcement of Functionality and Effectiveness of Event-Based Surveillance System (EBS), Egypt, April-September 2017

Fatma Osman; A Kandi; S Elrefaey; S Elshourbagy; H Abuelsoud; M Taha; A Gehad

## Corresponding Author:

Fatma Osman

## Abstract

**Background:** To meet the requirements of International Health Regulations 2005 (IHR), initiation of EBS is essential to complement the Indicator Based Surveillance (IBS) and to boost early detection of potential Public health threats. In November 2015, the Ministry of Health (MoH) launched the EBS at the central level. The hot line in emergency room and active browsing for electronic media are the main sources of information.

**Objective:** To enhance early detection and rapid response to potential public health threats and to improve the performance of the EBS team.

**Methods:** At the end of June 2017, the reporting form, database and the standard Operating Procedures (SOPs) of EBS were updated. EBS team received training for the system updates. Data from April to September was investigated for the source of information, signal filtration, verification, and timeliness of response. For the events that are routinely reported by IBS, early detection was checked for both systems. The results were compared three months before and after the training.

**Results:** Out of 762 raw signals, 199 events were detected, from which 65% (130/199) events after June. Proportion of events captured by electronic media, health care workers and community were 75% (150/199), 20% (40/199) and 5% (9/199) respectively. Filtration of signals varied significantly from 14 % to 51% (P value < 0.0001). Verification improved from 78% to 86 % (P value= 0.154). Positive Predictive Value (PPV) significantly differed from 80% to 93% (P value = 0.012). Rapid response within 24 hours significantly improved from 53% to 88% (P value < 0.0001). Capability of EBS to capture events Preceding IBS improved from 27% (9/33) to 38% (32/85) (P value= 0.288).

**Conclusions:** Increase EBS capacity for early detection of potential public health threats. Marked improvement of EBS team performance. Raise community awareness, expand the sources of information and shift to electronic database are highly recommended.

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