Ghazanfar Medical Journal (GMJ)

AFGHANISTAN

غضنفر طبي ژورنال

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Editor in Chief
Bashir Noormal, MD, MPH

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Acknowledgement

I am very pleased to note that Afghanistan National Public Health Institute (ANPHI) has been able to publish the first official peer reviewed medical journal. We felt dire need for a forum to disseminate scientific and research products for end users. Ministry of Public Health (MoPH) puts special emphasis on evidence based decision making and policy formulation. The progress made in the health sector is profoundly attributed to the data use and closely monitoring the trends of health indicators. I am delighted to initiate Ghazanfar Medical Journal (GMJ) with international standard criteria after the name of a great scientist Prof. Sayed Alef Shah Ghazanfar. I am also grateful to the Afghanistan National Public Health Institute for their excellent work in public health area.

I appreciate the endeavors of editorial groups for making this publication possible. I am looking forward to continuous publications over the years with keeping up the standard and quality of the journal. I appeal to all local as well as international researchers to submit their articles to GMJ, a peer reviewed journal of high quality.

Taking into account the ultimate outcome of a peer reviewed scientific journal being bringing change in the related targeted discipline, the Afghanistan National Public Health Institute will make this journal widely accessible and available to the potential audiences in order to use and apply the evidence brought up by some of the unique and excellent scientific studies contained in this journal to alter strategies and interventions in the delivery of healthcare in the country and beyond. The Ministry of Public Health of Afghanistan is fully in support of this excellent academic endeavor initiated by the Afghanistan National Public Health Institute and so advocate for further enrichment and publicity of it nationally and internationally. The leadership of the Afghan Ministry of Public Health recognizes this optimum achievement by the ANPHI and wish to witness further such rewarding deliveries in the years to come. At last, I am pleased to acknowledge the support of UNICEF for sponsoring the publication of 1st edition of GMJ.

Dr. Ferozuddin Feroz
Minister of Public Health
Islamic Republic of Afghanistan

Editorial Note

It gives us immense pleasure to launch the first edition of Ghazanfar Medical Journal (GMJ) the first official peer reviewed medical journal of Afghanistan National Public Health Institute, Ministry of Public Health of the Islamic Republic of Afghanistan. It has been our long endeavor to provide a forum for wide dissemination of scientific work and research products.

Afghanistan National Public Health Institute (ANPHI) was established in 1963 with support of German Government. After 25 years of excellent performance in public health area and one of the few such institutes in the region, ANPHI remained dormant during the years of war and unrest. It was revived in 2006 with the support of Centers for Disease Control and Prevention (CDC) USA. Since then, it has contributed profoundly in promoting research activities and developing human resources in public health. In the last few years, Afghanistan has made tremendous progress in the field of public health and research and we felt dire need for a journal to disseminate data for evidence based decision making and policy development.

The editorial board is pleased to launch GMJ after the name of Prof. Sayed Alef Shah Ghazanfar, the real son of this nation in recognition of his marvelous scientific works in medical science. The journal has been registered in the Ministry of Information and Culture of Afghanistan. We intend to maintain a high standard of peer review process and publication. GMJ is open to local as well as international article submissions.

Biography of Prof. Ghazanfar

Prof. Ghazanfar is one of the few scholars of his era in Afghanistan. He has contributed profoundly to the advancement of medical science. He was the founder and pioneer of several research and training institutes and entities across the country. Prof. Ghazanfar being an inspiring figure has become a model for most of our younger generation.

Prof. Ghazanfar was born in Kolangar district of Logar Province in the year 1928 in a religious and middle class family. At an early age, Prof. Ghazanfar had innovative ideas which made him unique among his fellow villagers. However, due to economic constraint, he did not receive formal education until the age of 14, where he completed 2nd to 4th grades at once. After completion of his primary education, he joined Kabul School of Nursing. After successful graduation in 1946, he joined Aliabad hospital as a mental health nurse. At the same time he continued his secondary education and completed grade 9, 10 and 11 simultaneously from Sayed Jamaluddin High school and joined Habibia High school one of the leading educational centers in the country. Later, he joined American University at Beirut, where he stood first among students from 50 countries of the world. In recognition of his hard work, he was given admission to study medicine at prestigious Harvard University, USA. After graduation in 1961, he joined a researchers group at Harvard and continued his research activities. He was a member of American Professors Research and Curative group.

On his return to Afghanistan, he served the nation under several capacities as:

- Assistant prof. Department of Biochemistry Kabul Medical Institute 1963-1971
- Dean Academics, Kabul Medical Institute 1967-1971
- Director of Public Health Institute, Ministry of Public Health 1972-1973 and established 46 laboratories for hospitals and provincial health centers
- Director of Planning Department, Ministry of Public Health 1973-1976
- Director of Pharmacy Department, Ministry of Public Health 1976-1980
- Prof. Department of Biochemistry Kabul Medical Institute 1981-1991
- Chancellor of Kabul Medical Institute (currently Kabul Medical University) 1992
- Advisor with World Health Organization (WHO) for laboratory services and higher education 1994-2009
- Member of Mental Health Volunteers Association

He conducted numerous researches in several disciplines and few are enlisted below:

- Edited and published tens of scientific articles and books
- Determined (plank) degree with adaptation to Einstein photo electric equation
- Determined arsenic in liver and arsenic poisoning events and identified bismuth and phosphorus

interaction similarities in this nature of poisoning
- Identified phosphates sediments in the brain
- Identified the impact of pH on iron absorption in the stomach and intestines
- Determined inulin in plasma and urine
- Separated enzyme- carbonic anhydrates- from human red blood cell and determined the spiral amount which was presented in a conference represented by 5000 international scientists
- Studied the abnormalities of hemoglobin and the product published in Lebanon's medical papers

At his personal capacity, he executed the following honors to his country:
- He utilized his personal award ($20,000 from United States scientific foundation coalition) and established a research laboratory at the department of Biochemistry Kabul Medical University
- He donated machinery for the production of Saline to Aliabad hospital worth $30,000
- Equipped Kabul medical press digital colored printers with the support of WHO at a cost of $250,000 in the year 1986
- Established AIDS diagnostic center in Kabul in 1988
- Established DNA diagnostic and molecular biology laboratory in the department of forensic medicine
- Modernized and equipped the Lab at Ghazanfar Institute of Health Sciences (GIHS)
- Revised and updated the curricula for Kabul Medical University in 2005
- Developed new curriculum for laboratory technician program in GIHS
- Equipped bacteriology and virology laboratory of MoPH with new technologies such as PCR and ELIZA

In recognition to his excellent work, the government of the Islamic Republic of Afghanistan has honored Prof. Ghazanfar with below awards:
- The central library of Kabul Medical University was renamed to Prof. Ghazanfar
- The Ministry of Public Health has renamed the Institute of Health Sciences to Ghazanfar Institute of Health Sciences in 2008
- He was awarded the prestigious "Sayed Jamaludin Afghan Medal" by the former President of the Islamic Republic of Afghanistan, His Excellency Hamid Karzai in 2008
- The Ministry of Public Health has begun Prof. Ghazanfar Honorary Award in 2012 and the first one was awarded to Prof. Ghanzanfar by former President of the Islamic Republic of Afghanistan, His Excellency Hamid Karzai

Prof. Ghazanfar has passed away on 21st of March 2013 after serving his country for almost 5 decades. The members of editorial board have the honor to name the first peer reviewed medical journal after the name of the real son of this nation (Prof. Ghazanfar).

Instructions for Submission of Articles

Peer Review Process

After submission, the article will be reviewed by the editor and statistician to review methodology and general presentation of the research according to GMJ criteria. A code will be assigned to all articles and the future correspondence will be by code number. The articles are sent to two external reviewers (peers) and the comments are exchanged between authors and reviewers. On satisfactory response, the articles are shared with the editorial board and on compliance with the Journal's instruction and editorial board's comments the editor finally decides the publication.

Ethical Consideration

The manuscript will be in compliance with the guidelines of Council for International Organizations of Medical Science (COIMS) and Helsinki declaration. The editor reserves the right to reject the articles on ethical grounds. The report for randomized control trials (RCTs) should be according to CONSORT statement. All RCTs should be registered at an international RCT centers.

Conflict of Interest

The authors shall inform the editor about the conflict of interest such as financial, personal or academic that may influence their judgment.

Plagiarism

The manuscripts which have used the verbatim texts and contents of published articles will not be accepted for publication.

Structure of Article

Title

The title should describe the article's content clearly and precisely, and allow the reader to decide whether it would be appropriate to consult the article further. Unnecessary words such as 'A study of', 'Investigations of', 'Observations on', etc. should be omitted. It should not have abbreviations and jargon.
In short, the title of an article for GMJ should:

- Be 10-12 words
- Identify the main issue of the paper
- Begin with the subject of the paper
- Be accurate, unambiguous, specific, and complete
- Show the study design and study setting
- Mention target population

Authors

In accordance to the International Committee of Medical Journal Editors (ICMJE) the following points on authorship should be considered during submission of articles for GMJ:

- Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.

- Authorship credit should be based on substantial contributions to:
  1. Conception and design, or acquisition of data or analysis and interpretation of data;
  2. Drafting the article or revising it critically for important intellectual content; and
  3. Final approval of the version to be published and publicly take responsibility for the data and conclusions
- Authors should meet conditions 1, 2 and 3.
- Acquisition of funding, collection of data or general supervision of the research group does not justify authorship.

The following information should be included in the title page regarding authors:

- name by which each author is known, with his or her highest academic degree(s) and institutional affiliation;
- name of the department(s) and institution(s) to which the work should be attributed;
- disclaimers if any;
- name and address of the author responsible for correspondence about the manuscript;
- the name and address of the author to whom requests for reprints should be addressed, or a statement that reprints will not be available from the author and
- source(s) of support in the form of grants, equipment, drugs, or all of these.

Abstract

It should briefly describe the problem being addressed in the study, how the study was performed, the salient result and what the authors conclude from the results. Structure of abstract should be in accordance to the article type. A structured abstract should not be more than 250 words for original article. The structured abstract should consist four paragraphs, under the headings: Objective, Methods, Results and Conclusion. If reporting quantitative data, results should mention key frequencies, percentages and findings. Abstracts should be followed by 3-10 MeSH words (key-words). Details available from the Medical Subject Headings (MeSH) list of index medicus. For assistance see: http://www.ncbi.nlm.nih.gov/mesh

Introduction

The introduction should be brief, ideally 2-3 paragraphs long. It should clearly state the problem being investigated, the background that explains the problem, and the reasons for conducting the research. It should summarize relevant research to provide context, state how the authors' work differs from published work and importantly what questions the article answer. Briefly describe your experiment, hypothesis, research question(s), and general experimental design or method.

Methods

The main purpose of this section is to provide the reader enough details so they can replicate the research. It should explain how the problem was studied, identify the procedures the author followed, and order these chronologically where possible. The methods identify the equipment and describe materials used and specify the source if there is variation in quality of materials. It should also include the frequency of observations, what types of data were recorded. It should also name any statistical tests used so that the numerical results can be validated. It is advisable to use the past tense, and avoid using the first person. This section should be no more than 2 pages.

Results

Results should objectively present the findings, and explain in words what was found. This section shows that new results are contributing to the body of scientific knowledge, so it is important to be clear and lay them out in a logical sequence. The data should be analyzed and presented in the form of figures (graphs), tables, and/or description of observations. It is important to clearly identify for the reader any significant trends. The results section should follow a logical sequence based on the table and figures that best presents the findings that answer the question or hypothesis being investigated. Tables and figures are assigned numbers separately, and should be in the sequence that the author refers to them in the text. Figures should have a brief description (a legend), providing the reader sufficient information to know how the data were produced. It is important not to interpret the results - this should be done in the discussion section. It should not have more than 2-3 tables and 2 graphs.

Discussion

In this section, the author should describe what his/her results mean, specifically in the context of what was already known about the subject of the investigation. The author should link back to the introduction by way of the question(s) or hypotheses posed. Author should indicate how the results relate to expectations and to the literature previously cited, whether they support or contradict previous theories. Most significantly, the discussion should explain how the research has moved the body of scientific knowledge forward. It is important not to extend conclusions beyond what is directly supported by the author's results, so avoid undue speculation. It is advisable to suggest practical applications of results, and outline what would be the next steps in the study. The author should also discuss the strengths and weaknesses in relation to other studies.

In short the discussion should at least talk about:

- statement of principal findings
- strengths and weaknesses of the study
- strengths and weaknesses in relation to other studies

Conclusion

The paper should end with strong and clear conclusion. It should be like a "thunderbolt in reverse": it begins with thunder (introduction) and ends with lightning (conclusion). Conclusion should be linked with the goals of the study, and should be limited to the boundaries of the study. Authors should avoid unqualified statements and conclusion not completely supported by the data. For example, they should not make statements on economic benefits and costs unless their manuscript includes economic data and analysis. Authors should refrain from claiming unjustified priority about the findings. It should be noted that a negative finding could be as important as a positive finding.

In short the conclusion should at least talk about:

- Meaning of the study, possible mechanisms and implications for clinicians and policymakers
- Unanswered questions and future research conclusion.

Acknowledgment

This section should be brief and include the names of individuals who have assisted with the study, including, contributors, suppliers who may have provided materials free of charge, etc. Authors should also

disclose in their article any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their article.

References

Both the in-text citations and references for Ghanzanfar Medical Journal are in APA format. All the materials should be cited in APA format. For more information see: https://owl.english.purdue.edu

Submission and formatting requirements for manuscript

Original article should be maximum 3,000 words excluding title page, a structured abstract of 250 words and references with no more than three tables or figures and 25 references

The manuscript must be written in American English. Non-native English speakers must seek the assistance of experienced, English-speaking medical editors if in doubt.

- Type the manuscript on A4 size (8.5x11 inches or 21.6x27 cm) white bond paper, with margins of at least 1.5 inches (4 cm).
- Type on one side of the paper, double spacing every page.
- Begin each section on separate page and in the following order: title page, abstract, introduction, materials/ subjects/ patients and methods, results, discussion, conclusion, acknowledgements, references, tables and figures with legends.
- Number pages consecutively in the upper right-hand corner of each page, beginning with the title page. Type the page number.
- Present decimal figures up to 2 decimals only. e.g. 0.07 is correct instead of 0.071.
- Sentences should be properly structured instead of giving brackets within a sentence. For example, the study participants (women of age group 25-30 years) were approached for the interviews. The correct way is 'The study participants included women of age group 25-30 years. They were approached for the interviews.'

Both the printed version (in A4 size, double space) and the soft copy should be submitted to the GMJ.

When submitting the manuscript to GMJ it should accompany a letter, which addresses the following:

- Information on prior or duplicate publication or submission elsewhere of any part of the work;
- A statement of financial or other relationships that might lead to conflict of interest;
- A statement that the manuscript has been read and approved by all the authors, that the requirements for authorship have been met, and that each author believes that the manuscript represents honest work; and
- The name, address, and telephone number of the corresponding author, who is responsible for communicating with other authors about revisions and final approval of the proofs.

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End line Assessment of the Integrated Behavioral Change Communication Project by UNICEF

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Abstract

Background: Afghanistan is one of the countries in the world with highest maternal and child mortality rates. High child mortality rates can be attributed to lack of access to safe drinking water, food, poor access to health care services, inadequate sanitation, and low literacy rates. Lack of awareness is also a key factor for low utilization of existing services. UNICEF in collaboration with the Ministry of Rural Rehabilitation and Development, Ministry of Public Health and Ministry of Education supported an integrated BCC strategy that was based on inter-sectoral convergence and participatory community processes in the six districts of the country namely Daman in Kandahar, Zinda Jan in Heraat, Surkhroad in Nangarhar, Jabul Saraj in Parwan, Bamyan Center in Bamian and Dawlatabad in Balkh.

Results: The assessment of BCC intervention was carried out by adopting multiple techniques of data collection including quantitative and qualitative methods. The personal interviews with head of households, married women and their husbands were done through household sample survey. Under qualitative methods, focus group discussions (FGDs) with key informants in community, women, men, health providers, program implementers and other stake holders were done. In-depth interview and participant's observation with key informants from the community and case study from each province were carried out.

Conclusion: The result indicates clearly that the program had been able to establish its visibility in the community and people are willing to have such programs in their areas. An increase in awareness and changes in the practices were reported in the targeted provinces. With varying degree, these behavioral changes were noted regarding all the components covered under the BCC.

د څېړنې لنډیز

مقدمه: افغانستان په نړۍ کی یو له هغو هیوادونو څخه دئ چی د میندو او ماشومانو د مړینی کچه پکښی دیره لوړه ده. پاکو اوبو ته د ډیرو کورنیو او ماشومانو نه لاسرسئ، کافی او متوازنو خوړو ته نه لاسرسئ، روغتیایی خدماتو ته په تیته کچه لاسرسئ، د شخصی او چاپیریال خورا ناکافی نظافت ساتنه او بلاخره د سواد د کچی تیټوالی هغه عمده لاملونه دی چی د ماشومانو د مړینو ددغی ډیری لوړی کچی سبب ګرځیدلې دي. د عامه وګړو د خبرتیا یا اګاهۍ د کچی تیټوالی یو بل کلیدی لامل یا فکتور دئ چی خلک له موجودو روغتیایی تسهیلاتو/ امکاناتو څخه چندان ګټه نه پورته کوي. په افغانستان کی د یونسف اداری د عامی روغتیا، پوهنی، او د کلیو د بیا رغونی او پراختیا له وزارتونو سره په ګډه د وګړو د سلوک د بدلولو د مفاهمی پر یوی مدغمی ستراتیژۍ (Integrated BCC strategy) باندی کارکړی چی د بیلابیلو سکټورونو او ټولنی د ونډی اخستنی یوه خورا ښی بیلګی د هیواد په شپږو ولسوالیو (دامان ولسوالی په کندهار کی، زنده جان ولسوالی په هرات، سرخرود په ننګرهار کی، جبل سراج ولسوالی په پروان، د بامیانوولایت مرکز او دولت آباد په بلخ ولایت کی) وی.

پایلی: د ارقامو د راټولولو د یوشمیر تخنیکونو په کار اچونی سره چی کمی او کیفی متودونه دواړه پکښی شامل ول، د سلوک بدلونی د مفاهمی د مداخلو ارزونه تر سره شوه. د کورنس له مشر، میړونۍ ښځو، او د هغوی له خاوندانو (میړونو) سره مخامخ مرکی تر سره شوي. د کمی متودونو په چوکاټ کې د ټولنی له خبره ګانو، ښځو، نارینه وو، روغتیایی کارکوونکو، د پروګرام له پلی کوونکو او نورو رول درلودونکو اړخونو سره متمرکزی مرکی په ګروپونو کې تر سره شویدي. همدارنګه ژوری مرکی له کلیدی افرادو سره هغه چی په ټولنه کی یی تر نورو زیاته اګاهی او پوهه درلوده به بیلابیلو ولایتونو کې تر سره شویدی.

وروستۍ پایلې: لاسته راغلی پایلی ښيي چی پروګرام په ښکاره ډول په ټولنو کی یوځه بدلون رامنځته کړئ او خلک لیوال دی تر څو دا ډول پروګرامونه چی ددوی او ددوی د ماشومانو د روغتیا په ښه والی کی یی رول لوبولی، په راتلونکی کی او په نورو ځایونو کی هم پلی شي. د خلکو د اګاهۍ د کچی لوړیدل او د هغو په عملونو کی بدلون په ټولو دغو ولایاتو کی راپور ورکړ شویدئ. البته په بیلابیلو درجو دغه سلوکی بدلونونه د پوښښ لاندی ساحو کی د پروګرام په ټولو اجزاوو کی په ستړګو شوی دئ.

Background

Reduction of child and maternal mortality are the two top national priorities for Afghanistan. Afghanistan is one of the countries in the world with highest maternal and child mortality rates. High maternal and child mortality rates reflect the poor conditions in which most Afghan women and children live. High child mortality rates can be attributed to lack of access to safe drinking water, food, poor access to health care services, inadequate sanitation, and low literacy rates. Lack of awareness is also a key factor for low utilization of existing services.

The objective of reducing child and maternal deaths can be turned into reality if they are empowered with knowledge and skills to improve household care practices. Since majority of childbirths in Afghanistan take place at home, it is critical that Behavior Change Communication (BCC) for child and maternal survival be addressed at the household level. Under this backdrop, to ensure the objective of addressing behaviors at the household level that could advance maternal and child survival, UNICEF in collaboration with the Ministry of Rural Rehabilitation and Development (MRRD), Ministry of Public Health (MoPH) and Ministry of Education (MoE) supported an integrated BCC strategy that was based on inter-sectoral convergence and participatory community processes. UNICEF - Afghanistan sought the services of community-based organizations that had extensive experiences, working with communities in Afghanistan and other countries, particularly in applying Participatory Learning and Action processes, to implement the integrated BCC strategy in the six districts namely Daman in Kandahar, Zinda Jan in Heraat Surkhroad in Nangahar, Jabul Saraj in Parwan, Bamyan Center in Bamyan and Dawlatabad in Balkh. The BCC Strategy was introduced with identified ten household practices out of the global package of key household practices that UNICEF has developed through research and field experience in many developing countries. The BCC pilot project was launched in October, 2007. The main purpose of Integrated BCC Strategy was to enable communities in the six districts where the project is piloted with ten key behavioural outcomes surrounding child and mother survival.

The BCC strategy was supposed to ensure that communities in the six districts are better informed about the available services and are motivated to utilize those services.

Objectives of the Study

The purpose of this study was to provide an end of project evaluation that seeks to answer such questions as “did the project make a difference to the lives of the people it was intended to benefit? And “did the project achieve its goal and purposes?” the variables under study was compared to baseline study (child immunization, child illnesses, prenatal, postnatal, breast feeding, education, hygiene).

Methodology

The assessment of BCC intervention was carried out by adopting multiple techniques of data collection including quantitative and qualitative methods. The personal interviews with head of households, married women and their husbands

were done through household sample survey. Under qualitative methods, focus group discussions (FGDs) with key informants in community, women, men, health providers, program implementers and other stake holders were done. In-depth interview and participant's observation with key informants from the community and case study from each province were carried out. The available records and registers at facility were also reviewed. The study areas were Daman district in Kandahar, Zinda Jan district in Heraat, Surkhroad district in Nangarhar, Jabul Saraj district in Parwan, Bamyan Center in Bamyan, and Dawlatabad district in Balkh.

The sample was drawn from the villages and urban units of the district and 150 households were selected randomly to give equal chance of selection to each household in the sample. The number of Primary Sampling Units (PSU's) selected from each district was predetermined as 10. The PSU's (10) were selected by probability proportional to size (PPS) sampling. In this sampling procedure the probability of selecting a particular village is equal to the proportion of the population of that village in district population. UNICEF/implementing agency provided the lists of selected villages covered under BCC intervention in all the targeted districts. The village-wise population was used as sampling frame to select first village and then HHs from the village by using Systematic Random Sampling method. We have conducted 150 personal interviews, 4 FGDs, and 5 in-depth interviews per district.

Results

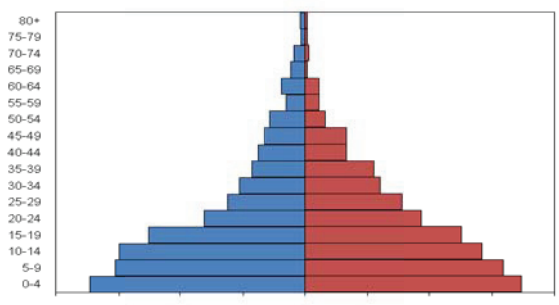
Household Characteristics

The age distribution of population is typically of high-fertility populations, with a high proportion of population in the younger age-groups. Nearly one-third of the total population is below 10 years of age and 47 percent is below 15 years of age. Nearly 7 percent of the population is age 50 or older, and such proportion is significantly higher among males (8.9 percent) as compared to females (4.7 percent). The sex ratio was found to be 877 females per 1000 males.

Overall, nearly half of the total persons were married by the time of this survey. Sex-wise distribution indicates that around 47 percent of males and 55 percent of females were found to be married.

The level of education of household members may affect reproductive behavior, health of children, and proper hygienic practices. In this study, the information on educational status was obtained for the person age 5 and above. Survey indicated that nearly 48 percent of the males and one-third of the females had attended schools. In addition, around 4 percent of males and females attended Madarsa. The major source of drinking water for 41 percent of the households is hand-pump, and most of these are using public hand-pumps. Only 13 percent of the households are able to get piped water for drinking. A large majority of the households (72 percent) are using traditional pit type toilets. Use of flush toilets is quite rare in the area. It was found that around 60 percent of the households are using Iodized salt.

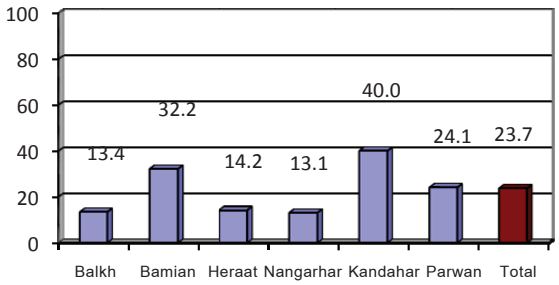
Figure 1: Population Pyramid



Child Immunization

It was found that the immunization card was available with only 59 percent of the respondents. A comparison of the end line figures with the baseline estimates indicates a slight improvement of 9 points in the overall percentage of mother having immunization card. Around 47 percent of the children were found fully vaccinated. The percentage of fully immunized children was as low as 22 percent in Nangarhar. It was highest in Heraat, where more than two-thirds of the children were fully immunized. The coverage of measles was 54 percent (the corresponding figure for baseline was 43 percent). The percentage of children receiving first, second and third dose of DPT and polio also indicated improvement compared with the baseline. It appeared during the discussions that people are quite aware that immunization is important for children. However, it was found that some of the participants were unaware of the nature of vaccine protection to a particular disease. There is need to enhance their knowledge.

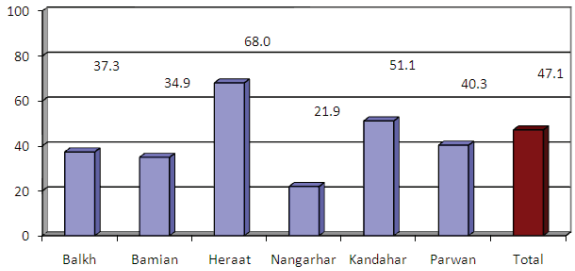
Figure 2: Percent of children weighted at birth



Growth Monitoring

It was found that the growth monitoring component requires more efforts. Only 15.2 percent of mothers of children below 24 months had card for the reference child. Ofthe children who have had growth monitoring cards, 43 percent were weighted in the last four months. Although the proportion in both indictors is quite low, it shows an improvement when compared with the baseline figure, which was as low as 3 percent and 11 percent, respectively.

Figure 3: Percent of children fully immuzed, (12-23 months)



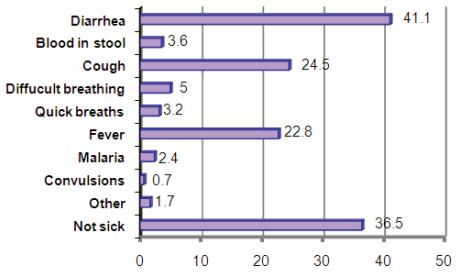
Childhood Illness

A large proportion of women (71 percent) knew fever as the sign of illness. However, the level of awareness about other signs of childhood illnesses is still low, and there is a need to provide more information on this issue. Regarding prevalence of diseases, a large proportion of the respondents (41 percent) reported at least one episode of diarrhea to their child during the last two weeks preceding the survey. Nearly one-fourth reported cough and almost an equal proportion also reported fever during the reference period. Around 8 percent of the children suffered from difficult or quick breathing. Overall, around 67 percent of the children had at least one disease during the last two weeks prior to the survey. It is encouraging to note that a large majority (84 percent) of the women had heard about Oral Rehydration Salt (ORS). A comparison of the awareness level about ORS between baseline and end line estimates indicates an impressive improvement of around 21 percentage points.

Moreover, around 85 percent of the women were able to correctly identify one liter of water as the proper amount of water to be added to prepare fluid with one packet of ORS. A large majority (97 percent) of them used boiled water for preparing ORS. Regarding treatment, around 77 percent of

the respondents sought treatment or advice from outside when their child had diarrhea. Around 73 percent of the children who had diarrhea were given fluid made of ORS or liquid made from sugar, water and salt. The indicators related to the knowledge and use of ORS has shown improvement when compared to the baseline estimates.

Figure 4: Percent experienced diseases

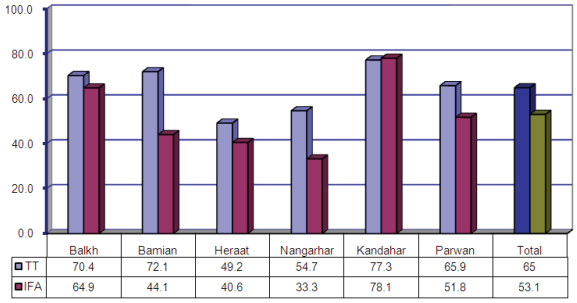


Pre-natal Care

This study revealed that around 56 percent of the women were possessing prenatal cards for the youngest child. Although this proportion is low, this indicator shows an impressive improvement when compared with the baseline estimates (which was 15 percent). The major reasons for increase in the possession of prenatal cards may be the increase in the awareness about the importance of having the card. As far as prenatal coverage is concerned, 80 percent of the women visited some-one (health related) at least once for prenatal care, which is around 20 points higher than the baseline estimates. Around 27 percent of the women visited doctor for prenatal care, and an equal proportion of women contacted nurse or midwife. Around 46 percent of the women visited health personnel thrice or more. Around two-thirds of the women had received TT injection, and more than half (53 percent) received Iron Folic Acid tablets or syrup during pregnancy. Both these indicators have improved compared to the baseline. However, in the light of the fact that nearly 80 percent of the mothers got antenatal visit, yet only 53 percent received IFA, it appears that it may not be a standard practice to provide IFA during the prenatal visit.

Nearly 61 percent of the women were aware that if a pregnant woman has excessive bleeding, it is a danger sign. However, the awareness about other danger signs was quite low. It is important to note that still some of the complications are perceived as normal conditions, and this is the reason that no specific action is taken in that direction.

Figure 5: Percent of women received TT and IFA by Province



	Balkh	Bamian	Heraat	Nangarhar	Kandahar	Parwan	Total
TT	70.4	72.1	49.2	54.7	77.3	65.9	65
IFA	64.9	44.1	40.6	33.3	78.1	51.8	53.1

Safe Motherhood

Still a large proportion (68 percent) of deliveries is conducted at home- either their own home or somebody else's home. Nearly half of the deliveries are conducted by trained health professionals, including doctors, nurse, midwife and trained birth attendants. Although these indicator seems to be too low, but both indicators have improved compared to the baseline estimate.

The major constraints for institutional deliveries were reported to be the problem of transportation and wide spread poverty. Delivery kits were reported to be available by around half of the women. Of those who reported availability, more than 90 percent reported its use also.

Table 1. Type of care taken for safe delivery

Items	Percent
Percentage of Institutional Deliveries	32.1
Percentage of Deliveries assisted by trained health professionals	49.8
Percent reporting availability of clean birth kit	50.2
Percent reporting use of kit (of those who reported availability)	90.6
Percent reporting use of New blade for cutting cord	63.9

Postnatal Care

Nearly 36 percent of the women received postpartum contact. Although this indicator is still quite low, it is 11 percent higher than what was found at the time of baseline (25 percent). The need for improving this further cannot be overruled. Furthermore, of those who received postnatal care services, more than 70 percent also received checkup of the child. Around 27 percent of the mothers with children below 24 months of age have received Vitamin A supplementation within two months after the last delivery. This indicator also shows an improvement, as the baseline estimate for the same was 22 percent. The obvious reason for low coverage of Vitamin A supplementation is low coverage of postpartum care. Although three-fourths of the women were aware that excessive bleeding after delivery could be a danger sign, but awareness about other danger signs was quite low. Only 40 percent were aware about fever and 22 percent were aware about abnormal discharge as a danger sign, which need special care.

Table 2: Awareness about danger signs after delivery

Item	Percent
Percent knowing danger signs for mother after delivery	
Fever	39.7
Excessive bleeding	74.9
Abnormal discharge	22.4
Other	6.6
DK	3.8
Percent knowing danger signs among newborns	
Poor feeding	44.2
Fast breathing	38.7
Not active	17.5
Redness around cord	37.9
Red/discharging eye	13.5
Other	9.7
DK	7.2

Hand Washing Practices

Nearly three-fourth of the households had a designated hand washing area. This indicator shows a significant improvement during the pilot, as the proportion of households having a designated place for hand washing has increased from 33 percent in the baseline to the present level. It is interesting to note that 73 percent of the household had kept soap or detergent at the place allocated for hand washing. Awareness about hand washing was also quite high. Around 90 percent of the respondents consider washing hands with water and soap as important.

Table 3: Awareness and practices regarding hand-washing

Items	Percent
Percent think hand-washing with water and soap is important	90.3
Important timing of washing hands	
Before eating	53.0
After eating	38.9
Before cooking	41.1
After defecation	66.9
After cleaning baby faeces	41.7
Other	7.6

Breast Feeding

Around 88 percent of the women breastfed their child and nearly 73 percent of the mothers of children age 6-11 months were breastfeeding at the time of survey, of those who breastfed, more than

two-third had initiated breastfeeding immediately within one hour of birth. Around 68 percent of the women fed colostrum to the child, which is very crucial for the child. Of those who were continuing breastfeeding, a large majority (74 percent) was breastfeeding as and when demanded by the child.

Education & Girls' Education

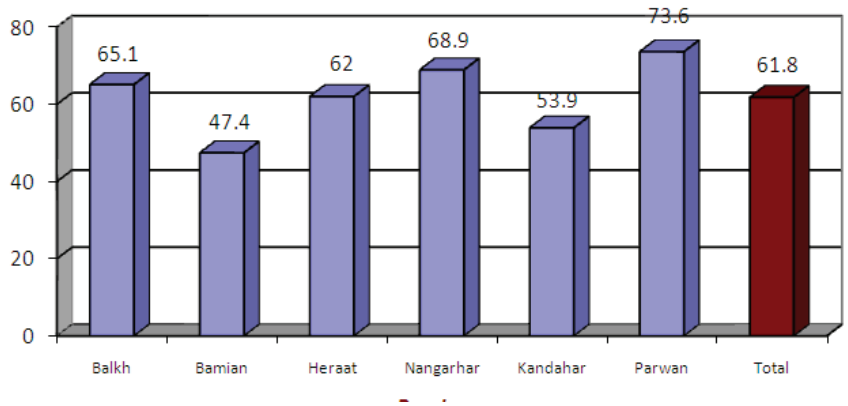
Around 62 percent of the children in the reference age category (age 5-18 years) were attending schools. The major problem with the education, specifically of girls, is accessibility to schools and problem of mobility. Only 40 percent of the respondents have a school within the range of half an hour distance, and 27 percent of the respondents are living in areas where it takes more than an hour to reach the school.

gram should be continued in their area. This information indicates towards the worth of the program as perceived by the community.

Conclusion

The above analysis clearly indicates that the program had been able to establish its visibility in the community, and people are willing to have such programs in their areas. An increase in awareness and changes in the practices were reported in all the provinces. With varying degree, these behavioral changes were noted regarding all the components covered under the BCC strategies. Based on the findings, it is suggested that BCC activities should be kept continued for a longer duration. Not only because this has created greater awareness and behavioral changes, but also because these need to be expanded, and the messages need to be repeated in order to make the changed behaviors sustainable. The meeting between partners for the improvement of the program should be conducted on a routine basis. The project may include some other issues based on the local need and country level priorities.

Figure 6: Percent of children (5-18 yrs) attending school



BCC Interventions

It was found that nearly 53 percent of the respondents had heard about the BCC program which is implemented through CDC and VHC to improve the health of child and mother. Of these, around 69 percent of the respondents felt that the program was useful for them or their family. Nearly half of the respondents were satisfied with the program, and most of them opined that the pro-

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Maternal Health Care Trends in Afghanistan

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Abstract

Introduction: Pregnancy and birth-related complications are leading causes of death among women of reproductive age in developing countries. In 2008 alone, an estimated 358,000 women worldwide died from complications related to pregnancy or childbirth (WHO, UNICEF, UNFPA, & World Bank, 2010a). The vast majority of maternal deaths occur in developing countries, where hemorrhage, obstructed labor, eclampsia, abortion, sepsis, and infection are the main causes of pregnancy-related complications (WHO et al., 2010a).

Methods: This paper presents secondary analysis of data from the 2010 Afghanistan Mortality Survey (AMS). The AMS, completed in 2010, provides a unique opportunity to assess progress toward achieving improved maternal health and maternal health care, and to examine coverage at the provincial level as well as nationally. Within selected households, all women of age 12-49 who were either usual residents of the household or who slept there the night before the survey were eligible to be interviewed (AMS, 2010). The sample for the AMS was selected using a two-stage stratified selection process, based on the 2011 Afghanistan Population and Housing Census (PHC) sampling frame obtained from the Central Statistics Organization (CSO) (AMS, 2010).

Results: The study shows overall progress toward improving coverage of all three maternal health indicators (ANC, deliveries attended by SBAs, and PNC). On average, there has been an increase of roughly 10% in each of the indicators. This level of progress is not as substantial as might be expected, considering the major investments to support key health interventions in Afghanistan aimed at providing quality health care, with the main focus on improving the health of mothers and children under age 5. These interventions include the basic package of health services and the hospital reform project.

Conclusion: The findings indicate that the efforts toward improving and expanding access to maternal health care services throughout the country have had an impact. A similar positive trend in coverage of antenatal care and skilled assistance at delivery has been reported by the Health Management Information System (HMIS) in the Afghan Ministry of Public Health (MoPH). Also, the levels of ANC and skilled birth attendant coverage reported in the current study (Table 4) agree with levels reported in the Multi Indicator Cluster Survey in Afghanistan (MICS, 2012).

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د څېړنې لنډیز

مقدمه: په بلاربون اوزېږونونو پوری اړونده اختلاطونه په مخ په ودی په حال هیوادونو کی د اومیندوارۍ د عمر په ښځو کی د مړینو عمده لاملونه بلل کیږی. د یونیسیف، روغتیا نړیوال سازمان، UNFPA او نړیوال بانک (۲۰۱۰ کال) په حواله، یوازی په ۲۰۰۸ کال کی ددغو اختلاطونو (بلاربون اوزېږونونو پوری اړوند) له کبله په ټوله نړۍ کی د ۳۵۸۰۰۰ په شاوخواکی میندو خپل خوږ ژوند له لاسه ورکړئ دئ. ددی مړینو عمده برخه په مخ په ودی په حال هیوادونو چیرته چی ولادی خونریزی، انسدادی ولادتونه، اکلامپسیا، ماشوم غورځونه یا سقطونه، سیپسیس او نور انتانات د میندو د مړینی عمده لاملونه دي، واقع کیږی (د روغتیا نړیوال سازمان ۲۰۱۰a).

د څېړنې میتودونه: دغه مقاله دهغو ارقامو یوتحلیل دی چی د ۲۰۱۰ کال د افغانستان د مړینو په سروی (AMS ۲۰۱۰) کی تر لاسه شویدی. د افغانستان د مړینو دغی سروی چی په کال ۲۰۱۰ کی بشپړه شوی، یو ښه فرصت په افغانستان کی د میندو د روغتیایی حالت د معلومولو، ارزونی او بهبود په برخه او آن د ولایاتو په کچه د هغوی د پوښښ د اندازی او مقایسوی ارزونی په برخه کی برابر کړیدئ. په ټاکل شوو کورنیو کی ټولی هغه ښځی چی عمر یی د ۱۲ او ۴۹ کلونو تر منځ وو که دا دهماغی کورنی غړی ول او یا یی د سروی د ورځی څخه مخکی شپه په همدی کور کی تیره کړی وی، په سروی کی شاملی شوی او ورسره مرکه ترسره شوی ده. د سروی لپاره د نمونو اندازه یا شمیر د دوه مرحله یی پروسی په وسیله د احصایی د مرکزی اداری د ۲۰۱۱ کال د سرشمیرنی د ارقامو پر بنسټ ټاکل شوی وو.

پایلی: دغه مقاله په عمومی ډول د میندو د روغتیا په برخه کی د دری واړه شاخصونو (د زیږون څخه د مخه څارنی (ANC)، هغه زیږونونه چی د یوه ماهر ولادی کارکوونکی په مرسته تر سره شوی وی، او تر زیږون وروسته مراقبتونو د تر لاسه کولو) بهبودي راښيي. په اوسط ډول په ټولو دغو شاخصونو کی تر سروی د مخه پنځو کلونو په موده کی د شاوخوا ۱۰٪ په اندازه بهبودي راغلی ده. د هغو هلو ځلو، مداخلو او منابعو په کار اچولو او پام کی لرلو سره تر څو د څارنو په کیفیت، او په ځانګړی ډول د میندو اوتر پنځو کلونو کم عمر ماشومانو په روغتیا یی حالت کی ښه والی او بهبود راولي، دغه بهبودی په هغه اندازه نه ده چی توقع یی کیده او باید وای. دغه مداخلی اوهلی ځلی د لومړنیو روغتیایی څارنو دبستی او د روغتونی خدمتونو د ضروری بستی له پلی کولو څخه عبارت وو.

وروستۍ پایله: خو سره د هغو هم تر لاسه شوی ارقام او معلومات دا په ګوته کوی چی د میندو د روغتیایی حالت د بهبود او هغو ته د رسیدنی په موخه هڅی او هلی ځلی د هیواد په کچه خپل اغیز درلودلی دئ. دی ته ورته مثبت بدلون د زیږون څخه د مخه څارنی (ANC)، او هغه زیږونونه چی د یوه ماهر ولادی کارکوونکی په مرسته تر سره شوی وی، په برخه کی د عامیروغتیا وزارت د روغتیایی معلوماتو د اداری د سیستم په وسیله هم ښودل شویدئ. د زیږون څخه د مخه څارنی (ANC)، او هغه زیږونونه چی د یوه ماهر ولادی کارکوونکی په مرسته تر سره شوی وی، په برخه کی د کومه اندازه چی په دی سروی کی تر لاسه شوی، د همدغو شاخصونو له اندازی سره چی د MICS ۲۰۱۲ یا د څو شاخصه خوشه یی سروی څخه تر لاسه شوی، هم سر لګوی.

Introduction and Background

Pregnancy and birth-related complications are leading causes of death among women of reproductive age in developing countries. In 2008 alone, an estimated 358,000 women worldwide died from complications related to pregnancy or childbirth (WHO, UNICEF, UNFPA, & World Bank, 2010a). The vast majority of maternal deaths occur in developing countries, where hemorrhage, obstructed labor, eclampsia, abortion, sepsis, and infection are the main causes of pregnancy-related complications (WHO et al., 2010a). When adequate health facilities, proper treatment, and emergency care are available, these complications should not lead to death. However, too often these essential maternal health care resources are not available or accessible to women in need. The fifth Millennium Development Goal (MDG)—to reduce maternal mortality by three-quarter between 1990 and 2015—is one of the prime objectives of countries struggling with quality of health care for women (Eijk et al, 2006). To achieve this goal it is necessary to understand where gaps in service provision lie, to learn from the experience of areas that have succeeded in improving coverage of maternal health care, and to apply these lessons strategically in areas that have made less progress.

Afghanistan has long been recognized as having one of the highest levels of maternal mortality in the world (WHO, 2010a). In Afghanistan an estimated 40% to 50% of women's deaths during the childbearing years are related to complications during pregnancy and childbirth (AMS, 2010; MoPH, 2006). According to the recent 2010 Afghanistan Mortality Survey (AMS), women's risk

of dying from complications during pregnancy or childbirth is very high, estimated at 327 deaths per 100,000 live births for the seven-year period preceding the survey (AMS, 2010). This level of pregnancy-related mortality is higher than comparable estimates for surrounding countries, including Bangladesh, where the pregnancy-related mortality ratio was estimated at 194 deaths per 100,000 live births, based on the 2010 Bangladesh Demographic and Health Survey (DHS) (Streatfield et al., 2011), and Pakistan, where the ratio was estimated at 297 deaths per 100,000 live births, based on the 2006/7 Pakistan DHS (NIPS and MI, 2008).

Women in Afghanistan have only limited access to health care, due to several factors (UNICEF, 2006, NRVA, 2007). These factors include restricted mobility, few female health care providers, few health care facilities that treat women, poor household incomes, difficulty accessing health care facilities, and little education (Lynn et al., 2002; Abreu, 2011). Furthermore, maternal health outcomes and access to maternal health care vary throughout the country. The majority of provinces in Afghanistan are mountainous, with underdeveloped economies, poor health conditions, and inadequate maternal health care services (ANDS, 2008). In order to address these geographic disparities, a strategic community-oriented package of health services, referred to as the Basic Package of Health Services (BPHS), was introduced in 2003, with a focus on areas of major health need in vulnerable population groups, including mothers and children (Acerra et al, 2009). Equitable delivery of health services to vulnerable groups, particularly women of reproductive age, has been a longstanding priority for policymakers and public health managers in Afghanistan.

Women's risk of maternal death appears to have fallen substantially in Afghanistan in recent years. In 2003, for example, Afghanistan's maternal mortality ratio was estimated at 1,600 deaths per 100,000 live births, according to the Reproductive Age Mortality Survey (RAMOS) (Bartlett, 2005), nearly five times higher than the level estimated in 2010 at 327 deaths per 100,000 (AMS, 2010). Estimates of women's lifetime risk of maternal death also have shown improvement in recent decades. Based on 1999–2002 data collected from four sites, Bartlett et al. (2005) estimated the lifetime risk of maternal death at between one in six and one in nine, whereas today, according to the 2010 AMS, approximately one in every 50 Afghan women dies of pregnancy-related causes. These improvements appear to be consistent with the level of skilled assistance during delivery, skilled birth attendance, and delivery in health facilities, all of which have increased rapidly in Afghanistan in recent years. Despite years of continuous conflict, Afghanistan has made significant progress in rebuilding its health system. The National Reproductive Health Strategy 2006–2009 has contributed to improving the health of the people of Afghanistan, especially women and children, through the implementation of the basic package of health services (BPHS) and the essential package of hospital services (EPHS) as the standard, agreed-upon minimum package of health care services to be provided at each level of the health system.

Between 2003 and 2012, the number of graduated midwives in Afghanistan increased from 467 to 3,001, according to the Afghan Midwifery Education and Accreditation Board report. In addition, there has been a gradual increase in the number of births attended by skilled birth attendants (SBAs). In 2006 the Afghanistan household survey showed that 19% of births were attended by SBAs, while the National Risk and Vulnerability Assessment 2007/2008 showed that 24% of wom-

en delivered with a skilled birth attendant. More recently, the Ministry of Public Health (MoPH) Partnership Contracts for Health 2010 Household Survey showed that about one-third (34%) of deliveries were attended by an SBA (Huber, Saeedi, and Samadi, 2010). As stated in the Afghanistan National Development Strategy (ANDS, 2008), understanding the demographic features of the country, with a focus on provincial needs, can contribute to responsive public health interventions at the national and provincial levels. Regional studies in other countries, including China, have reported substantial geographic variation in the use of health care services by women (Liu et al, 2011). While studies in Afghanistan have found that maternal health outcomes vary according to urban versus rural residence (MoPH, 2008; MoPH, 2010), no nationally representative studies appear to have examined province-level variation in maternal health care utilization. Therefore, the present study uses nationally representative data to describe and interpret trends in coverage of three key maternal health care services across provinces in Afghanistan, in order to contribute to evidence-based maternal health care planning and effective strategies to improve maternal health care in the provinces of the country.

Methods

This paper presents secondary analysis of data from the 2010 Afghanistan Mortality Survey (AMS). The AMS, completed in 2010, provides a unique opportunity to assess progress toward achieving improved maternal health and maternal health care, and to examine coverage at the provincial level as well as nationally. The AMS is a nationally representative household survey that collected information on mortality levels and causes, as well as information on fertility, family planning behavior, and utilization of maternal and child health services (AMS, 2010). Within selected households, all women of age 12-49 who were either usual residents of the household or who slept there the night before the survey were eligible to be interviewed (AMS, 2010). The sample for the AMS was selected using a two-stage stratified selection process, based on the 2011 Afghanistan Population and Housing Census (PHC) sampling frame obtained from the Central Statistics Organization (CSO) (AMS, 2010). The sampling design and survey implementation procedures for the AMS are described in detail in the survey final report (AMS, 2010).

The survey was designed to generate estimates of indicators for the entire country, as well as for urban and rural settings, and for three geographic domains—the North Zone, Central Zone, and South Zone. The map displays the provinces of Afghanistan and outlines the three geographic domains used in the AMS. It is important to note that, due to serious known security concerns, the rural areas of three provinces, Kandahar, Helmand, and Zabul, which account for slightly less than 9% of the population, were excluded from the AMS sample. In addition to these areas, a small percentage of selected primary sampling units (34 of 751 selected PSUs) were not able to be surveyed, largely due to security problems in the south of the country. The survey ultimately covered about 87% of the total population of Afghanistan, and 66% of the population in the southern provinces (AMS, 2010). The AMS sample included 47,848 women age 12-49. For this study, the sample was restricted to the 16,988 women age 12-49 years who had a live birth in the five years preceding the survey. This subsample was used to generate national estimates of maternal health care coverage.

In order to assess maternal health care service utilization, this study examined women's use of three essential maternal services: antenatal care (ANC),

delivery care by a skilled birth attendant (SBA), and postnatal care (PNC). To examine receipt of ANC, this study examined use of at least one antenatal visit with a doctor, nurse, or midwife, based on women's responses to two questions regarding their last live birth: "Did you see anyone for antenatal care during this pregnancy?" and "Who did you see?" (AMS, 2010). To examine delivery by an SBA, information on the delivery of women's last live birth was used to identify women who reported that this birth was attended by either a doctor, nurse, or midwife, based on women's response to the question: "Who assisted with the delivery of [name]" (AMS, 2010). To examine PNC, women who said that someone checked on their health within two days of the delivery of their last live birth were identified, based on their response to the following two questions: "After [name] was born, did anyone check on your health?" and "How long after you delivered [name] did the first check on your health take place?" (AMS, 2010). Finally, the study examined receipt of all three key services—the full continuum of maternal health care—as a fourth indicator.

It should be noted that while delivery in a health facility is another commonly used maternal health indicator, this indicator was not included in the study's assessment of maternal health care coverage, because home delivery is widely accepted in Afghanistan and current programs focus on use of SBAs rather than health facilities for deliveries.

The approach used to compare coverage across provinces consisted of two methods: first, provinces were compared in their overall coverage of maternal health services during the five years preceding the survey; and second, maternal health care utilization was disaggregated into one-year periods in order to examine trends in health care utilization by province during this five-year period. To facilitate this comparison, provinces were ranked in terms of both methods of comparison—overall maternal care coverage and progress in achieving coverage. Provinces were first ranked according to performance on the indicators, and then the ranked provinces were put into three groups of equal size (two groups of 10 and one group of 11 provinces). The goal of this exercise was not to grade individual provinces' performance but to use the rankings as an analytic tool to help compare provinces, to identify commonalities across provinces with similar performance, and to learn from areas with improved coverage in recent years as a guide for allocating resources and improving maternal health care programs.

It was possible to examine 31 of Afghanistan's 34 provinces (all except Kandahar, Helmand and Zabul, where due to security problems only urban areas were sampled). However, in the examination of progress during the five-year period studied, estimates for an additional eight provinces were suppressed, due to insufficient sample size at the provincial level. If a province had fewer than 25 women age 12-49 with a birth in any one of the previous five years, or fewer than 40 cases in the either the first or fifth year (since these two years were used to assess trends), it was not possible to generate reliable estimates of trends in maternal health care coverage. The information for these provinces was included in national coverage estimates for progress, but their provincial estimates were suppressed. Despite these exclusions, the 23 provinces are sufficient to provide a reasonable geographical representation of the country in studying use of maternal health care services. All tables reflect weighted percentages and population sizes. The analysis was conducted using SPSS, version 19.

Results

First, we present overall coverage of antenatal care (ANC),

delivery assistance by a skilled birth attendant (SBA), use of postnatal care (PNC), and receipt of all three essential services for the most recent birth among women who gave birth during the five years preceding the survey, by province in Afghanistan. Second, we examine improvement in coverage of each indicator during this five-year period.

Table 1. Percentage of women age 15-49 who had a live birth in the five years preceding the survey and who received three types of maternal care services for their most recent birth, according to province, Afghanistan 2010*

Region	Province	Percentage receiving antenatal care from a skilled provider	Rank Group	Percentage delivered by a skilled provider	Rank Group	Percentage receiving PNC within 2 days following the birth	Rank Group	Percentage receiving ANC, skilled attendance at birth and PNC	Group	Number of women
Capital	Kabul	86.4	1	74.9	1	43.2	1	38.1	1	1,757
Capital	Kapisa	62.0	2	24.5	2	15.7	3	12.3	3	316
Capital	Logar	79.8	1	85.1	1	24.1	2	23.0	1	227
Capital	Panjsher	72.7	1	16.9	3	15.9	3	12.6	2	88
Capital	Parwan	78.0	1	34.7	2	25.8	2	21.6	1	432
Capital	Wardak	56.6	3	18.0	3	16.8	3	15.9	2	320
Central Highland	Bamyan	72.9	1	29.2	2	26.1	2	18.5	2	193
Central Highland	Daykundi	37.9	3	2.2	3	5.6	3	0.0	3	364
Eastern	Kunar	35.9	3	26.9	2	18.5	2	14.9	2	808
Eastern	Laghman	77.2	1	46.4	1	55.1	1	41.2	1	415
Eastern	Nangarhar	58.4	2	44.1	1	27.1	1	20.8	1	1,616
Eastern	Nuristan	12.6	3	2.8	3	2.4	3	2.4	3	206
North Eastern	Badakhshan	47.0	3	9.5	3	9.3	3	5.3	3	752
North Eastern	Baghlan	57.5	2	31.4	2	9.1	3	8.0	3	565
North Eastern	Kunduz	72.5	1	33.1	2	28.8	1	27.0	1	595
North Eastern	Takhar	57.2	2	23.5	3	17.6	2	12.4	3	700
Northern	Balkh	79.1	1	43.0	1	21.3	2	17.5	2	843
Northern	Faryab	64.2	2	16.9	3	15.8	3	12.2	3	790
Northern	Jawzjan	74.9	1	35.6	1	24.0	2	17.1	2	425
Northern	Samangan	65.8	2	30.4	2	19.5	2	11.4	3	286
Northern	Sari Pul	70.6	2	24.7	2	19.9	2	16.7	2	388
South Eastern	Khost	43.6	3	44.6	1	27.0	1	17.8	2	538
South Eastern	Paktika	15.5	3	7.8	3	6.0	3	1.6	3	418
South Eastern	Paktya	73.6	1	21.2	3	20.1	2	15.8	2	589
Southern	Ghazni	48.0	3	30.9	2	29.5	1	23.2	1	497
Southern	Urozgan	62.2	2	48.1	1	49.6	1	38.5	1	230
Southern	Nimroz	70.8	2	57.3	1	29.4	1	28.7	1	84
Western	Badghis	16.3	3	4.8	3	2.9	3	1.4	3	387
Western	Farah	46.6	3	27.7	2	26.4	1	19.7	2	420
Western	Ghor	14.9	3	5.4	3	5.5	3	2.1	3	400
Western	Herat	59.1	2	35.1	1	27.2	1	21.6	1	1,063
	Total	**59.6**		**34.3**		**23.4**		**18.4**		**16,998**

*Three provinces (Zabul, Kandahar and Helmand) are not shown because the AMS sample included only urban areas.

Overall Coverage of Maternal Health Care

Table 1 presents coverage estimates for all three key maternal health services (ANC, delivery by an SBA, and PNC), as well as the proportion of women who received the full continuum of care for their last live birth in the five years preceding the survey. Nationally, 60% of women reported that they received antenatal care from a skilled provider for their last live birth, 34% reported that their last live birth was delivered by a skilled provider, and 23% reported that they received postnatal care within two days following delivery of their last live birth. Eighteen percent of women received all three maternal services for their last live birth. Coverage of antenatal care is the highest of the four indicators, ranging from 13% in Nuristan to 86% in Kabul. Coverage of skilled birth delivery ranges from as low as 2% in Daykundi to 75% in Kabul, and coverage of postnatal care ranges from 2% in Nuristan to 55% in Laghman.

Antenatal care is an essential gateway to accessing further maternal care services. In all provinces except Logar and Khost, coverage of ANC is higher than coverage of delivery assisted by an SBA, which in turn is nearly uniformly higher than PNC coverage, with the exception of Laghman, Urozgan, and Daykundi provinces. The drop-off between the proportion of women receiving antenatal care and the proportion receiving postnatal care is notable. Nationally, among women who had at least one antenatal care visit and had a skilled provider for their last birth, no more than 30% proceeded to have postnatal care within two days of delivery. Another way to examine the continuum of care is by tracing provinces' ranking across the three indicators of service coverage. Only nine provinces are consistent in their ranking for each indicator. Kabul and Laghman rank in the highest group for all indicators; Badakhshan, Badghis, Daykundi, Ghor, Nuristan, and Paktik rank in the lowest group for all indicators; and Sari Pul ranks in the middle group for all indicators. There is substantial variation in the ranking of other provinces across the indicators. Of interest, Ghazni, Farah, Kunar, and Khost rank in the lowest third in ANC coverage, but rank either in the first or second group for delivery care and postnatal care, and for receipt of all three services. In these provinces, women who access ANC are more likely to access the full continuum of maternal health care compared with women in other provinces, such as Balkh or Panjsher, that rank high in ANC coverage but rank lower in PNC coverage.

Another approach for examining provincial variation in maternal health care is to examine the trend or rate of progress in women's use of these services over the five years preceding the survey. As Figure 1 shows, use of all three services increased steadily during this period.

Figure1.Trends in maternal health services in the five years preceding the survey, Afghanistan AMS 2010

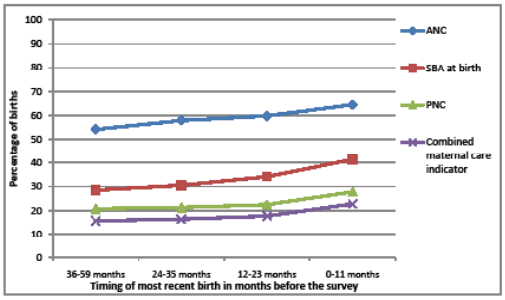

Table 2 Trend in antenatal care coverage by province, Afghanistan 2005-2010

Percentage of women age 12-49 who had a live birth in the five years preceding the survey who received antenatal care (ANC) from a skilled provider during pregnancy for the most recent birth by months of the birth before the survey, according to province, Afghanistan 2010*

		Percentage of women who received antenatal care from a skilled provider for their last live birth, by the timing of the last live birth						
		36-59 months before the survey	24-35 months before the survey	12-23 months before the survey	0-11 months before the survey	Rank Group Based on 5-year coverage**	Percentage point increase	Rank group based on percentage point increase
Region	**Province**							
Capital	Kabul	83.2	84.3	86.8	89	1	5.8	2
Capital	Parwan	76.8	68.9	82.2	80.3	1	3.5	3
Central Highland	Daykundi	(41.1)	(20.1)	(31.6)	(51.3)	3	10.2	2
Eastern	Kunar	28.8	35.9	36.8	40.9	3	12.1	1
Eastern	Laghman	78.1	68.3	75.8	83.4	1	5.3	2
Eastern	Nangarhar	49.4	58.7	56.5	67	2	17.6	1
Eastern	Badakhshan	40.6	44.6	50.4	51.1	3	10.5	2
North Eastern	Baghlan	53.1	(60.6)	50.1	64.3	2	11.2	2
North Eastern	Kunduz	57.8	71.4	81.9	81.4	1	23.6	1
North Eastern	Takhar	53.7	60.7	53.2	60	2	6.3	2
Northern	Balkh	71.1	77.1	80.6	84.2	1	13.1	1
Northern	Faryab	54.9	61.4	64.6	74.1	2	19.2	1
Northern	Jawzjan	64.6	74.4	81.9	78.2	1	13.6	1
Northern	Samangan	54.8	65.1	72.3	69	2	14.2	1
Northern	Sari Pul	54.5	72.6	73.2	76.2	2	21.7	1
South Eastern	Khost	41.6	45	47.8	36.5	3	-5.1	3
South Eastern	Paktika	(19.7)	22.7	12	(6.3)	3	-13.4	3
South Eastern	Paktya	78.2	77.6	73.9	66.9	1	-11.3	3
Southern	Ghazni	54.6	49.1	48.3	43.6	3	-11	3
Western	Badghis	2.9	22.5	23.6	14.8	3	11.9	2
Western	Farah	(48.7)	44.6	53	42.4	3	-6.3	3
Western	Ghor	12	18.6	16.9	13.2	3	1.2	3
Western	Herat	56.4	60.6	54	64	2	7.6	2
	Total	54.2	57.9	59.8	64.5		10.3	

Note: Figures in parentheses are based on fewer than 50 unweighted cases.

*Estimates for 11 provinces are not shown. Three provinces (Zabul, Kandahar and Helmand) are not shown because the AMS sample included only urban areas. Eight additional provinces are not shown (Kapisa, Wardak, Logar, Panjsher, Bamyan, Nuristan, Urozgan, and Nimroz) because the unweighted number of births during the year 36-59 months prior to the survey or the year 0-11 months prior to the survey was less than 40, so that it was not possible to examine improvement during this period.

**Coverage ranks are based on the 31 provinces included in Table 1, before excluding 8 additional provinces, as mentioned above. For this reason the groups are not of equal size in this table.

Table 2 presents the trend in coverage of antenatal care by a skilled provider over the five years preceding the survey, by province. As a summary measure for improvement, the table also presents the percentage-point increase in ANC coverage between the earliest and most recent coverage estimates. Overall, there has been notable improvement in the percentage of women who received antenatal care from a skilled provider for their last live birth in the five years preceding the survey, from 54% of women whose last birth was 36-59 months before the survey to 65% of women whose last birth was 0-11 months before the survey. Provinces differed substantially in progress with ANC coverage, however, from an increase in coverage of 24 percentage points in Kunduz to a decrease of 13 percentage points in Paktika. Table 2 also shows that several provinces that ranked lower in ANC coverage ranked higher in improvement in coverage over the survey period.

Three provinces in the highest rank group for overall ANC coverage also rank among the provinces with the most improvement in coverage: Balkh, Jawzjan, and Kunduz. Kunduz increased ANC coverage by over 20 percentage points during this five-year period. Also noteworthy is that Kunar, which ranks in the lowest group for overall ANC coverage, ranks in the highest group for improvement in coverage.

Table 3 Trend in use of a skilled attendant at birth by province, Afghanistan 2005-2010

Percentage of women age 12-49 who had a live birth in the five years preceding the survey whose most recent birth was delivered by a skilled birth attendant, by months of the birth before the survey, according to province, Afghanistan 2010*

Percentage of women whose last live birth was delivered by a skilled provider, by the timing of the last live birth

		36-59 months before the survey	24-35 months before the survey	12-23 months before the survey	0-11 months before the survey	Rank Group Based on 5-year coverage	Percentage point increase	Rank group based on percentage point increase
Region	**Province**							
Capital	Kabul	69.9	75.7	71.2	80.5	1	10.6	2
Capital	Khost	43.4	42	47.7	45.1	1	1.7	3
Central Highland	Badakhshan	7.1	6.1	10	14	3	6.9	2
Eastern	Paktika	(2)	4.6	11.8	(10.4)	3	8.4	2
Eastern	Nangarhar	41.6	41.1	41.6	51.1	1	9.5	2
Eastern	Samangan	15.7	30.6	26.8	45.5	2	29.8	1
Eastern	Takhar	18.1	13.2	27.4	29.2	3	11.1	1
North Eastern	Farah	(27.1)	28.2	30.2	25.7	2	-1.4	3
North Eastern	Herat	33.8	32.4	31.7	41.4	1	7.6	2
North Eastern	Kunar	27.4	30.6	24.3	26.5	2	-0.9	3
Northern	Laghman	47.7	47.8	36.5	53.7	1	6	2
Northern	Baghlan	30.3	(28.7)	26.8	37.9	2	7.6	2
Northern	Balkh	32.6	34.5	47.2	51.3	1	18.7	1
Northern	Kunduz	15.1	23.5	46.1	49.9	2	34.8	1
Northern	Parwan	27.8	31.1	29.6	45	2	17.2	1
South Eastern	Faryab	10.3	14.6	20	22	3	11.7	1
South Eastern	Badghis	3.3	4.9	6.4	4.4	3	1.1	3
South Eastern	Jawzjan	22.7	26.5	49.3	42.7	2	20	1
Southern	Sari Pul	16.1	19.3	28.8	30.8	2	14.7	1
Western	Ghor	3.4	3.2	6.3	7.1	3	3.7	3
Western	Paktya	20.1	16	22.6	24	3	3.9	2
Western	Daykundi	(2.1)	(0)	(0)	(5.1)	3	3	3
Western	Ghazni	30.9	32.3	27	32.7	2	1.8	3
	Total	28.5	30.5	34.1	41.4		12.9	

Table 4 Trend in coverage of postnatal care for the mother by province, Afghanistan 2005-2010

Percentage of women age 12-49 who had a live birth in the five years preceding the survey who received postnatal care (PNC) within two days of giving birth for the most recent birth by months of the birth before the survey, according to province, Afghanistan 2010

Percentage of women who received postnatal care for their last live birth, by the timing of the last live birth

		36-59 months before the survey	24-35 months before the survey	12-23 months before the survey	0-11 months before the survey	Rank Group Based on 5-year coverage	Percentage point increase	Rank group based on percentage point increase
Region	**Province**							
Capital	Kabul	43.1	45.7	39.4	45.1	1	2	2
Capital	Parwan	13.7	25.6	20.9	37.2	2	23.5	1
Central Highland	Daykundi	(8.7)	(2.1)	(0)	(8.3)	3	-0.4	3
Eastern	Kunar	22.9	15.7	14.7	21.7	2	-1.2	3
Eastern	Laghman	62.4	57.8	43.6	60.5	1	-1.9	3
Eastern	Nangarhar	28.9	26	21.8	31.6	1	2.7	2
Eastern	Badakhshan	4.8	3.9	14.1	12.3	3	7.5	2
North Eastern	Baghlan	13.1	(6.1)	7.2	10.7	3	-2.4	3
North Eastern	Kunduz	13.7	22.1	38.8	42.6	1	28.9	1
North Eastern	Takhar	13.2	10.5	21	21.4	2	8.2	1
Northern	Balkh	19	20	19.7	24.9	2	5.9	2
Northern	Faryab	8.3	13.2	20.6	20.5	3	12.2	1
Northern	Jawzjan	17.8	15.4	30	31.9	2	14.1	1
Northern	Samangan	12.4	19.3	16.2	28.5	2	16.1	1
Northern	Sari Pul	10.9	16.6	24.1	24.3	2	13.4	1
South Eastern	Khost	25.9	27	27.2	27.7	1	1.8	3
South Eastern	Paktika	(4)	1.6	9.3	(8.4)	3	4.4	2
South Eastern	Paktya	22.5	14.9	19.3	23.6	2	1.1	3
Southern	Ghazni	29.2	31.9	22.7	33	1	3.8	2
Western	Badghis	0	4	4.1	3	3	3	2
Western	Farah	(31.3)	27.9	31.1	19.6	1	-11.7	3
Western	Ghor	4	2.5	5.8	7.8	3	3.8	2
Western	Herat	25.8	22.2	26.4	33.4	1	7.6	1
	Total	20.7	21.2	22.4	27.8		7.1	

Note: Figures in parentheses are based on fewer than 50 unweighted cases.

*Estimates for 11 provinces are not shown. Three provinces (Zabul, Kandahar and Helmand) are not shown because the AMS sample included only urban areas. Eight additional provinces are not shown (Kapisa, Wardak, Logar, Panjsher, Bamyan, Nuristan, Urozgan, and Nimroz) because the unweighted number of births during the year 36-59 months prior to the survey or the year 0-11 months prior to the survey was less than 40, so that it was not possible to examine improvement during this period.

**Coverage ranks are based on the 31 provinces included in Table 1, before excluding 8 additional provinces, as mentioned above. Thus the groups are not of equal size in this table.

Table 3 shows trends in coverage of births attended by skilled attendants over the five years preceding the survey, by province. Overall, there has been noteworthy improvement in the percentage of births attended by SBAs, from 29% of women whose last birth was 36-59 months before the survey to 41% of women whose last birth was 0-11 months before the survey. The improvement was greatest in Kunduz, at an increase of 35 percentage points in skilled attendance at delivery, and least in Farah, at a decrease of 1.4 percentage points. Some provinces, notably Faryab, that ranked lower in SBA coverage ranked higher in progress increasing skilled attendance at delivery.

In general, the provinces with the strongest improvements in coverage of ANC also had strong improvements in the percentage of births delivered with a skilled birth attendant. Two exceptions are Kunar, which experienced a large increase in the coverage of ANC but essentially no change in coverage of skilled attendance at delivery, and Parwan, which showed almost no change in coverage of ANC but experienced a large improvement in skilled attendance at delivery, from 28% to 45%.

Table 4 presents trends in coverage of postnatal Care (PNC) received by mothers over the five years preceding the survey, by province. As a whole, there has been a slight improvement in the percentage of mothers who received PNC, from 21% of women whose last birth was 36-59 months before the survey to 28% of women whose last birth was 0-11 months before the survey, ranging among provinces from an increase of 29 percentage points in Kunduz to a decrease of 12 percentage points in Farah. Faryab had low PNC coverage but experienced a substantial increase in coverage in the five years preceding the AMS (from 8% to 21%). The provinces of Daykundi, Kunar, Laghman, Baghlan, and Farah all experienced decreases in the coverage of PNC, which indicates a need for further investigation and corrective intervention.

Table 5 Trend in continuum of care by province, Afghanistan 2005-2010

Percentage of women age 12-49 who had a live birth in the five years preceding the survey who received all three key maternal health care services (ANC, delivered with a skilled provider and received PNC within two days of giving birth) for the most recent birth by months of the birth before the survey, according to province, Afghanistan 2010

Percentage of women who received all three key services for their last live birth, by the timing of the last live birth

		36-59 months before the survey	24-35 months before the survey	12-23 months before the survey	0-11 months before the survey	Rank Group Based on 5-year coverage	Percentage point increase	Rank group based on percentage point increase
Region	**Province**							
Capital	Kabul	36.9	39	35.2	40.7	1	3.8	2
Capital	Balkh	12.2	16.2	18.4	21.1	2	8.9	1
Central Highland	Parwan	12.9	22.1	19.1	28.5	1	15.6	1
Eastern	Laghman	43.1	38.3	32.1	50.4	1	7.3	2
Eastern	Jawzjan	10.4	9	21.7	26.1	2	15.7	1
Eastern	Paktya	15.3	13.3	15.4	18.9	2	3.6	2
Eastern	Kunduz	12.8	20.8	36.5	39.7	1	26.9	1
North Eastern	Sari Pul	9	14.1	20.6	20	2	11	1
North Eastern	Samangan	6.3	12.3	8.2	18	3	11.7	1
North Eastern	Faryab	6	8.8	16.3	16.8	3	10.8	1
Northern	Herat	19	17.8	20.4	28	1	9	1
Northern	Nangarhar	21.4	19.8	16.3	25.5	1	4.1	2
Northern	Baghlan	11	(5.6)	5.6	10.1	3	-0.9	3
Northern	Takhar	9	7.5	15.1	14.8	3	5.8	2
Northern	Ghazni	25.8	23.7	18.5	24.4	1	-1.4	3
South Eastern	Badakhshan	4.4	3.1	4.6	8.7	3	4.3	2
South Eastern	Farah	(21.9)	21.3	24.8	13.7	2	-8.2	3
South Eastern	Khost	18.4	18.6	19.4	13.6	2	-4.8	3
Southern	Daykundi	(0)	(0)	(0)	(0)	3	0	3
Western	Kunar	15.5	10	13	20.9	2	5.4	2
Western	Badghis	0	4	1.5	0.7	3	0.7	3
Western	Paktika	(0)	0.5	2.5	(2.8)	3	2.8	3
Western	Ghor	0	1	2.3	3.9	3	3.9	2
	Total	15.6	16.3	17.6	22.7		7.1	

Note: Figures in parentheses are based on fewer than 50 unweighted cases.

*Estimates for 11 provinces are not shown. Three provinces (Zabul, Kandahar and Helmand) are not shown because the AMS sample included only urban areas. Eight additional provinces are not shown (Kapisa, Wardak, Logar, Panjsher, Bamyan, Nuristan, Urozgan, and Nimroz) because the unweighted number of births during the year 36-59 months prior to the survey or the year 0-11 months prior to the survey was less than 40, so that it was not possible to examine improvement during this period.

**Coverage ranks are based on the 31 provinces included in Table 1, before excluding 8 additional provinces, as mentioned above. Thus the groups are not of equal size in this table.

Table 5 shows that, overall, coverage of all three key maternal health care services increased during the five years preceding the survey, from 16% of women whose last birth was 36-59 months before the survey to 23% of women whose last birth was 0-11 months before the survey. Progress ranged widely among provinces, from an increase of 27 percentage points in Kunduz to a decrease

of 8 percentage points in Farah. Three provinces rank in the highest group both in coverage of all three maternal health services and improvement in coverage during the five-year period studied: Parwan, Kunduz, and Herat. In contrast, other four provinces—Baghlan, Daykundi, Badghis, and Paktika—rank in the lowest group in both overall coverage and in improvement in maternal health care coverage.

Discussion

The study shows overall progress toward improving coverage of all three maternal health indicators (ANC, deliveries attended by SBAs, and PNC). On average, Tables 2-5 show an increase of roughly 10% in each of the indicators. This level of progress is not as substantial as might be expected, considering the major investments to support key health interventions in Afghanistan aimed at providing quality health care, with the main focus on improving the health of mothers and children under age 5. These interventions include the basic package of health services and the hospital reform project. Still, the findings indicate that the efforts toward improving and expanding access to maternal health care services throughout the country have had an impact. A similar positive trend in coverage of antenatal care and skilled assistance at delivery has been reported by the Health Management Information System (HMIS) in the Afghan Ministry of Public Health (MoPH). Also, the levels of ANC and skilled birth attendant coverage reported in the current study (Table 4) agree with levels reported in the Multi Indicator Cluster Survey in Afghanistan (MICS, 2012).

Several factors could explain why ANC coverage is higher than the other two maternal health care indicators: ANC is less expensive, is available at more health facilities than skilled birth care, and may have received more emphasis than PNC from the service delivery side, while women may be more highly motivated to seek ANC care during pregnancy compared with care after delivery. Nonetheless, over the five years preceding the 2010 AMS, coverage of deliveries by SBAs and coverage of PNC increased more rapidly than coverage of ANC. As mentioned above, the Ministry of Public Health's HMIS data on coverage of ANC and deliveries with skilled attendance, collected at the health facility level, are largely consistent with the findings of this study, which are based on survey data. The HMIS data show that both the percentage of women receiving ANC and the percentage of deliveries attended by skilled attendants have increased across the whole country, by as much as 20% over the course of last six years, from 1384-1389 (corresponding to 2005-2009). The current study has the limitation of excluding 11 provinces, due to either security concerns or small sample size. Nevertheless, the results, which are based on a nationwide survey capturing the coverage of maternal health care services, with household data from 23 provinces, can be considered the main source of information for assessing maternal health status in the various provinces in the country.

The provincial comparison of maternal health care services further contributes to the evidence-based decisions of the Afghan Ministry of Public Health and supports its efforts to mobilize resources on an equitable basis across the country. Additionally, provinces with better maternal health care coverage and a higher rate of progress in coverage can be encouraged to share lessons learned from their experience with provinces with lower coverage and slower progress. Given the low coverage, and in a few cases the decline, in use of postnatal care (PNC) in most of the provinces, it is recommended that further studies could be conducted in these provinces looking at potential reasons for

low use of these services, in order to find ways to tackle the barriers accordingly. Studying the lessons learned from the provinces with relative high rates of PNC use would provide some insights to the MoPH in order to get a sense of the discrepancies in the use of PNC in the provinces with low rate of PNC. Additionally, it would perhaps be of interest to the MoPH of Afghanistan to conduct an assessment of health care delivery, involving review of the portfolio of the NGOs delivering health care and the provincial public health office in the provinces where low rates of ANC coverage are evident.

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The Effect of Birth Intervals on Causes of Under-Five Mortality in Afghanistan

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Abstract

Introduction: Every year millions of children die before reaching their fifth birthday. While the effect of the length of the birth interval on child health and survival is well established, there has been little exploration of the links between birth intervals and causes of under-five mortality at either global or regional levels. The purpose of this study is to explore the association between birth intervals and specific causes of death for children under age 5 in Afghanistan.

Method: This study is a retrospective analysis of data from the 2010 Afghanistan Mortality Survey (AMS 2010). The analysis is limited to deaths of children under age 5that occurred in the three years before the survey. The dependent variable is the cause-specific mortality rate (CSMR) among children under age five. The key independent variable is the length of the preceding birth interval, measured as the number of months between the birth of the child under study and the immediately preceding birth to the mother, if any. The analysis used both bivariate and multivariate designs.

Results: After adjusting for socio-demographic characteristics, children with a previous birth interval of less than 18 months have a higher risk of dying from certain causes of death, including sepsis and diarrhea compared with children with a previous birth interval of 24-35 months (the reference category). Children with a previous birth interval of at least 60 months also have a higher risk of dying from certain causes, including diarrhea and low birth weight, than children with a previous birth interval of 24-35 months.

Conclusion: The AMS 2010 provides a rich dataset that can be analyzed and used to generate new information for planners, program managers, and policymakers. This study, which combines data from the survey on causes of death with other covariates of the risk of death of children under age 5, has shown mechanisms by which the length of birth intervals may be related to the risks of dying in childhood. In particular, the length of birth intervals is significantly related to mortality risk from diarrhea, sepsis, and low birth weight. Further analyses in other settings are needed to confirm the generalizability of these conclusions and to establish whether children with non-optimal birth intervals are more likely to contract these diseases or to have higher case fatalities, or both.

د څيړنې لنډيز

مقدمه: هرکال په میلونونو ماشومان مخکی لدی چی خپل د عمر پنځمه کلیزه و نمانځي، له دې نړۍ څخه د تل لپاره سترګی پټوي. سره ددې چی د زیږونونو تر منځ د واټن د اوږدوالی اغیز د ماشومانو د ژوندانه اوعمر د کلونو په زیاتوالی کی تر زیاته بریده څرګند او ثابت شوی دئ، خو ددی واټن د اوږدوالي اړیکه د پنځو کلونو نه کم عمر ماشومانو د مړینې د لاملونو سره د حوزی په کچه او آن چی په نړیواله کچه چندان ښه واضح او څرګنده شوې نه ده. ځکه نو مو وغوښتل چی په دی څیړنه کی دغه اړیکه د افغانستان په تر پنځو کلونو کم عمر ماشومانو کی وڅیړو او څومره چی شونی وی جوته کړو.

د څيړنې میتودونه: د ا یوه Retrospective یا د تېروخت څېړنه ده چی د ۲۰۱۰ کال د افغانستان د مړینو د سروی یا AMS 2010 د ارقامو د شننی او تحلیل پر بنسټ تر سره شوی ده. دا شننه د هغو تر پنځو کلونو کم عمر ماشومانو په مړینی باندی متمرکزه ورپوری محدود ده، چی تر سروی د مخه دری کلونو په اوږدو کی مړه شوي دي.

په دې شننه کی د پام وړوابسته متغیر په پنځو کلونو کم عمر ماشومانو کی په ځانګړی لامل پوری اړوند د مړینې کچه یا CSMR او کلیدی غیروابسته متغیر تر څیړنی او شننی لاندی د مړه شوی ماشوم او تر هغه دمخه ماشوم (که موجود وو) د زیږونونو تر منځ (چی له یوی مور څخه وی) د واټن اوږدوالی دئ، چی د میاشتو په شمیر ښودل شوی دئ. به دی شننه کی له دواړو- هم bivariate او هم multivariate دیزاینونو څخه کار اخستل شوئ دئ.

پایلی: د اجتماعی- دیموګرافیکی ځانګړنو تر عیارولو وروسته، هغه ماشومان چی د خپل مخکنی ورور یا خور څخه تر اتلس میاشتو کمه موده کی پیدا شوی یا زیږیدلی وی، د هغو ماشومانو په پرتله چی د خپل مخکنی ورور یا خور څخه د ۳۵-۲۴ میاشتو په واټن زیږیدلی وی، د ټاکلو لاملونو(sepsis ، نس ناستی یا اسهال) له کبله د مړینی له لوړ خطر سره مخامخ وی. د پام وړ خبره دا هم ده، چی کوم ماشومان چی د خپل مخکني ورور یا خور څخه لږ تر لږه د ۶۰ میاشتو په واټن زیږیدلي وي، هغوی هم د ټاکلو لاملونو (اسهال، د زیږون لږ وزنی) له کبله د هغو ماشومانو په پرتله چی د خپل مخکنی ورور یا خور څخه د ۳۵-۲۴ میاشتو په واټن زیږیدلی وی، د مړینی له لوړ خطر سره مخامخ وی.

وروستۍ پایله: د افغانستان د ۲۰۱۰ کال د مړینی سروی د ارقامو یو ډیر غټ سیټ رامنځته کړئ، چی کیدای شی د پلان جوړوونکو، مدیرانو او پالیسی جوړوونکو لپاره د نوو معلوماتو د تر لاسه کولو په موخه تحلیل او تجزیه شي. دغی څیړنی د سروی څخه د مړینو د لاملونو په اړه تر لاسه شوی ارقام او د تر پنځو کلونو کم عمر ماشومانو د مړینی د خطر نور اړخونه سره یو ځای څیړلی او دا خبره جوتوی چی د زیږونونو تر منځ د واټن اندازه د ماشومتوب دوری د مړینی له خطرونو سره نیغ په نیغه اړیکه لری. په خاص ډول د زیږونونو تر منځ واټن د مړینی د داسی لاملونو لکه اسهال، سیپسیس او د زیږون کم وزنی سره څرګنده اړیکه ښیي. زمونږ په اند، په نورو ځایونو کی هم داسی او تر دی لا زیاتو څیړنو او شننو ته اړتیا ده تر څو ددی انګیرنو او اړیکو لا زیات پخلی وکړی.

Introduction

Every year millions of children die before reaching their fifth birthday. While the effect of the length of the birth interval on child health and survival is well established, there has been little exploration of the links between birth intervals and causes of under-five mortality at either global or regional levels. The purpose of this study is to explore the association between birth intervals and specific causes of death for children under age 5 in Afghanistan. By comparing the association between the length of birth intervals and various causes of death, we hope to better understand the pathways through which non-optimal birth intervals contribute to child mortality. The findings can help to introduce effective interventions to enhance child survival in Afghanistan.

Although under-five mortality remains a major public health problem, levels have dropped worldwide, from 12.0 million under-five deaths in 1990 to 6.9 million in 2011, of which 3.0 million were neonatal deaths, 2.0 million post-neonatal deaths, and 1.9 million deaths among children age 1–4 (UNICEF et al. 2012). In Afghanistan, levels of under-five mortality have decreased, from an estimated 287 deaths per 1,000 live births in 1970 to 121 deaths per 1,000 live births in 2010 (Rajaratnam et al. 2010). The Afghanistan Mortality Survey 2010 (AMS 2010) indicates that the under-five mortality rate is 97 deaths per 1,000 live births, the child mortality rate is 23, and the infant mortality rate is 76 deaths per 1,000 live births (Afghanistan National Public Health Institute et al. 2011).

Findings from the AMS 2010 show that access to maternal health services has improved markedly. The percentage of women who received antenatal care (ANC) from a skilled provider for their most recent birth increased from 16%, as estimated by the 2003 Multiple Indicator Cluster Survey (MICS 2003), to 60%, as reported by the AMS 2010. In addition, the proportion of births attended by medically skilled providers rose from 14% in 2003 to 34% in 2010. Prevalence of modern contraceptive use has also doubled, from 10% in 2003 to 20 % in 2010 (Afghan Public Health Institute et al. 2011, CSO and UNICEF 2004). Despite these improvements, rates of maternal and child mortality in Afghanistan are still higher compared to other

countries in the region.

One effective intervention for improving child survival is to promote optimal birth spacing. The research literature documents a close association between birth spacing and child mortality. A meta-analysis by Conde-Agudeloand and colleagues in 2006 found that both short birth intervals (6-17 months) and long birth intervals (59 months or more) were associated with significantly greater risk for adverse perinatal outcomes, such as preterm birth, low birth weight, and small size for gestational age (Conde-Agudelo et al. 2006). The authors suggested that spacing pregnancies appropriately could help to prevent such adverse outcomes. Earlier evidence from Pakistan in 1984 showed a strong relationship between preceding birth intervals of less than two years and childhood mortality rates. After age 2 the relationship was weaker, but nevertheless appreciable. The effects of birth spacing were not changed when controls were introduced for residence, education, sex, and family size (Cleland and Sathar 1984). A 2008 study by Rutstein using DHS data found that the risk of mortality rapidly decreases as the birth interval increases up to 24-29 months and then decreases more slowly with longer birth intervals, but increases again for intervals of 96 or more months (Rutstein 2008). Other studies in India, Malawi, Bangladesh and other settings have established similar associations between birth intervals and child mortality (Whitworth and Stephenson 2002, St George et al. 2000, Manda 1999, KuateDefo 1997, DaVanzo et al. 2004, Ronsmans 1996, Boerma and Bicego 1992, Yigzaw and Enquselassie 2010).

A number of causal mechanisms could explain the effect of the length of the birth interval on the risk of child mortality. In a systematic review of 58 observational studies, Conde-Agudeloand colleagues identified several mechanisms as links between short birth intervals and adverse health consequences, including folic acid deficiency, cervical insufficiency, vertical transmission of infections, inadequate breastfeeding, and sibling competition (Conde-Agudelo et al. 2012).

According to a systematic analysis done in 2008 by Black, the main causes of child mortality at age 1-59 months were infectious diseases, particularly pneumonia, diarrhea, and malaria. Forty-one percent of child deaths occurred during the first 28 days of life, mainly due to preterm birth complications, followed by birth asphyxia, sepsis, and pneumonia (Black 2010). In addition, a 2010 study in India showed that prematurity and low birth weight, followed by neonatal infections and birth asphyxia, were responsible for most neonatal deaths (The Million Death Study Collaborators 2010). Similarly, WHO estimated in 2005 that pneumonia, diarrhea, malaria, and neonatal sepsis accounted for more than half of all child deaths (Bryce 2005). A retrospective cohort study in 2003 found that the probability of complications such as intrauterine growth retardation, preterm birth, and perinatal death were most likely to occur with birth intervals of less than six months (Smith et al. 2003).

Despite such findings, the literature contains little information about the effect of the length of the birth interval on causes of child mortality. The purpose of this study is to help fill this knowledge gap.

Methods

This study is a retrospective analysis of data from the 2010 Afghanistan Mortality Survey (AMS 2010). The analysis is limited to deaths of children under age 5 years that occurred in the three years before the survey.

The dependent variable is the cause-specific mor-

tality rate (CSMR) among children under age 5. The key independent variable is the length of the preceding birth interval, measured as the number of months between the birth of the child under study and the immediately preceding birth to the mother, if any. The analysis used both bivariate and multivariate designs. A multivariate logistic regression model was applied to take into account the confounding effects of other factors affecting child mortality, such as age of mother at birth, birth order, age at death, type of residence, and economic status as measured by the DHS wealth index.

The AMS 2010 applied the standard procedures of the Demographic and Health Surveys (DHS). The AMS 2010 was implemented by the Afghanistan National Public Health Institute (ANPHI) and the Central Statistics Organization (CSO), with technical support from ICF International, the Indian Institute of Health Management Research (IIHMR), and World Health Organization Regional Office for the Eastern Mediterranean (WHO/EMRO). The main objectives of the AMS 2010 included collecting up-to-date information on the levels and causes of child, maternal, and adult mortality, fertility, family planning, and use of maternal health services such as antenatal care, institutional delivery, skilled birth attendants, and postnatal care. These indicators were estimated for the country as whole, for urban and rural areas separately, and for each of three survey domains (North, Central, and South).

The survey used a stratified two-stage cluster sampling design. The survey sample was selected from the 2011 Population and Housing Census (PHC) preparatory frame obtained from CSO. Overall, the survey was implemented in 22,351 households in all 34 provinces of the country. Due to security issues, however, the design of the survey excluded the rural areas of Kandahar, Helmand, and Zabul provinces. Also, 32 of the 751 clusters that were initially selected could not be covered due to insecurity. As a result, the survey covered 87% of the population of the country.

The AMS 2010 applied three types of questionnaires: a household questionnaire, a woman's questionnaire, and a verbal autopsy (VA) questionnaire. The household questionnaire collected general household information, such as location, household possessions, deaths, migration in and out of the household, and out-of-pocket expenditures for outpatient and in-patient services. A roster of household members collected information on the sex, age, relationship to the head of the household, and de-facto and de-jure household status.

The individual woman's questionnaire, a sample of women age 12-49 who stayed in the household the night before the survey were selected for interviewing. Questions were asked of 47,848 women and included a complete birth history for each child, with birth dates, sex, multiplicity of births, survival status, and age at death if not surviving, as well as data on the women's marital status and knowledge and use of family planning. Also, the individual woman's questionnaire collected information about antenatal, delivery, and postnatal care received by married women for their last birth in the five years before the survey. A demographic history of the respondent's siblings was included, in which women provided information about the number of children of their mother and the survival status of brothers and sisters, as well as age of surviving siblings or age at death and time since death of non-surviving siblings. Further information obtained by the questionnaire concerned the death of a sister, as to whether she died during pregnancy, during delivery, or in the two months after birth, to ascertain whether the death was pregnancy related.

The verbalautopsy (VA) used three forms and collected information from households about deaths that occurred in the three years preceding the interview, including the history of illness, signs and symptoms, and care received by the deceased before death. Fifteen physicians trained on the International Statistical Classification of Diseases and Related Health Problems (ICD-10) classification of cause of death reviewed all death records and filled out standard WHO death certificates noting the cause of death.

The data collected from the 22,351 households identified 6,044 deaths that occurred in the five-year calendar period prior to the survey, of which 2,904 were deaths of children under age 5. The VA questionnaire was completed for 3,933 of the deaths that occurred in the three-year calendar period prior to the survey, of which 1,927 deaths were to children under age 5, including those declared as born dead (Table 1).

Table 1. Number of records of various types, Afghanistan Mortality Survey, 2010

	Unweighted Number	Weighted Number
Households	22,351	22,351
Members		
De jure	177,810	175,438
De facto	177,392	175,079
Individual interviews		
Live births in history	116,360	115,770
Live births in preceding eight years	47,661	47,182
Stillbirths in history	2,554	2,493
Stillbirths in preceding three years	574	563
Deaths to children in pregnancy history		
Deaths of all ages	9,288	9,698
Deaths to children under age 5	8,547	8,963
Household deaths since 1 Hammal 1384*		
Deaths to household members of all ages**	6,044	6,212
Deaths to children under age 5	2,904	3,019
Verbal autopsies for deaths since 1 Hammal 1386*	3,933	3,951
Deaths to children under 5 and still births#	1,927	1,980
Matched verbal autopsy (VA) records		
Matched VA records for deaths under age 5##	1,618	1,679

* Deaths to usual household residents in the five calendar years prior to fieldwork were recorded (since 1 Hammal 1384 in the Afghan calendar, or 21 March 2005 in the Gregorian calendar).All recorded household death that occurred in the three calendar years prior to field work (since 1 Hammal 1386 in the Afghan calendar) were followed up with Verbal Autopsy questionnaires.

** Includes deaths with missing or unknown age: 14 (unweighted) and 125 (weighted).

Excludes nine deaths in VA form 1 and one death in VA form 2 with missing age at death.

Among the matched VA records for children who died under age 5, 88 (unweighted) and 90 (weighted) were declared «born dead» and this information was missing for 2 (unweighted and weighted) on VA form 1.These children are excluded.

This study linked information on each child's cause of death from the VA with information on the woman's birth history from the women's questionnaire. Of the 1,927 VA death reports for children under age 5, 1,618 were successfully matched to children listed in the women's birth histories. The two files were matched using the child's sex and date of birth, allowing for a discrepancy in the date of birth between files of one day in either direction. The final analytic sample for this study contained matched information for 1,618 deaths in the three years preceding the survey.

To derive overall estimates of the probability of dying in the first five years of life, this study also used the birth cohort corresponding to the period captured in the verbal autopsy. The VA included deaths to children in the three years before the interview, so these under-five deaths could correspond to births up to eight years before the interview. Thus, estimates of under-five mortality were generated using the 47,661live births in the eight years before the interview.

The analysis begins with an assessment of the percent distribution of cause of death, separately for each category of birth interval. Logistic regression models were run to calculate adjusted percent distributions of cause of death, so that the distribution of causes of death could be examined within birth interval categories, after adjusting for levels of other key background characteristics that could also affect cause of death. The logistic regression models adjusted for the mother's age at birth, the survival status of the preceding pregnancy, maternal education, residence, wealth, and geographic remoteness. To derive adjusted percentages, the unadjusted percentages were multiplied by the adjusted risk ratios for birth intervals generated in the logistic models.

In order to calculate adjusted cause-specific mortality rates, first the all-cause under-five mortality rates were calculated among live births in the eight years preceding the interview. Cox proportional hazard models were used to calculate the differential probability of dying in each birth interval category (see Appendix Table 1 for unadjusted all-cause early child mortality rates disaggregated by birth interval category).The overall risk of dying by age 5 in the referent birth interval category (24-35 months) was multiplied by the adjusted relative risk of dying in each birth interval category, in order to generate the adjusted risk of dying by age 5, controlling for the key background characteristics listed above. These all-cause mortality estimates were then multiplied by the adjusted distributions of cause of death (presented in table 3) in order to calculate cause-specific under-five mortality rates. To generate standard errors for these estimates, the standard errors associated with beta coefficients from the logistic regression model estimating the odds of dying from specific causes were combined with the standard errors associated with beta coefficients from the Cox proportional hazards

Results

Table 2 shows the distribution of births and matched deaths to children under age 5 by their preceding birth interval. Among all births in the eight years preceding the interview, 17% were first births. Short intervals of under 24 months accounted for 33% of the births. Slightly less than one-third of the births occurred 24-35 months after the preceding birth, and the remaining 21% of births occurred more than 35 months after the preceding birth.

Of all deaths among children under age 5 that took place in the eight years before the survey (3,015), 18% were among first–born children. A higher proportion of children who died had a short birth interval of 0-23 months, at 42% compared with

33% among all children. For children who died, just over one-fifth of the preceding birth intervals were 24-35 months, and 18% had a previous birth interval of 36 or more months.

The distribution of birth intervals within the sample of VA-matched deaths is similar to the distribution of birth intervals among all deaths to children under age 5 in the eight years preceding the survey, although a somewhat smaller percentage of matched children who died had a birth interval of less than two years compared with all dead children (36% versus 42%).

Table 2. Percent distribution of births in the preceding eight years by duration of preceding birth interval, according to survival status, and percent distribution of matched verbal autopsy (VA) records by preceding birth interval, according to age at death, unweighted

	Preceding birth interval						Total	
	0-23 months %	24-35 months %	36-47 months %	48-59 months %	60+ months %	First births %	%	N
Births in the preceding eight years								
All births	33.1	29.3	11.5	4.8	4.3	16.9	100.0	47,521
Living children	32.5	29.8	11.7	4.8	4.3	16.9	100.0	44,455
Dead children under age 5	42.3	21.5	9.3	4.1	5.0	17.7	100.0	3,015
VA matched deaths to children under age 5								
All deaths to children under age 5	36.2	21.9	12.1	5.8	6.6	17.5	100.0	1,618
Neonatal	34.9	22.4	10.3	4.8	5.7	21.8	100.0	682
Post-neonatal	34.9	21.3	12.7	6.0	8.9	16.2	100.0	582
Infant	34.9	21.9	11.4	5.4	7.2	19.2	100.0	1,264
Toddler (12-23 months)	41.2	22.7	13.9	6.2	4.1	11.9	100.0	194
Age 24-59 months	40.0	20.6	15.6	8.8	4.4	10.6	100.0	160

Table 3 presents the percent distribution of deaths by specific causes, separately within each birth interval group. In the full sample of 1,618 VA matched deaths to children under age 5, acute respiratory infection caused more than one-fifth of the deaths, while just under one-fifth of the deaths resulted from perinatal conditions. Diarrhea and sepsis were each the primary causes of 10% of the deaths, and injury was the primary cause for an additional 7%.Congenital conditions, low birth weight/ being born preterm, and malnourishment were each the primary cause for under 5% of deaths; the remaining 20% of deaths had other causes.

Several causes of death, including sepsis, low birth weight/preterm birth, and diarrhea, appear to be a more prevalent cause of death

Table 3. Unadjusted and adjusted percentages of children dying by specific causes and birth intervals among children dying before

	Cause of death																			
	ARI		Diarrhea		Sepsis		Perinatal conditions		Injury		Congenital		Low birth weight/ preterm		Mal-nourished		Other causes		Total	
	%	Adj %	%	Adj %	%	Adj %	%	Adj %	%	Adj %	%	Adj %	%	Adj %	%	Adj %	%	Adj %	%	Adj %	N
Birth interval																				
<18 months	19.6	19.0	11.4	12.6	12.0	12.6	18.7	17.3	6.1	6.6	4.1	3.9	5.6	5.8	3.8	3.6	18.7	18.6	100.0	100.0	342
18-23 months	22.2	21.9	15.6	16.4	7.8	7.9	12.8	13.1	9.1	9.0	4.9	4.9	2.9	2.4	5.3	4.7	19.3	20.3	100.0	100.0	243
24-35 months*	**20.9**	**20.9**	**7.6**	**7.6**	**7**	**7**	**18.6**	**18.6**	**8.8**	**8.8**	**3.4**	**3.4**	**4.8**	**4.8**	**4.2**	**4.2**	**20.9**	**20.9**	100.0	100.0	354
26-47 months	28.1	27.7	11.2	11.6	7.7	8.1	13.3	11.6	7.1	8.1	3.5	3.5	5.6	2.6	3.6	3.6	20.4	19.9	100.0	100.0	196
48-59 months	25.5	25.8	11.7	11.5	7.4	7.4	18.1	16.9	6	10.5	2.1	2.2	4.3	3.3	3.2	3.2	18.1	17.6	100.0	100.0	94
60+ months	15.1	16.7	11.3	11.9	12.3	13.9	19.4	16.4	4.7	5.6	3.8	3.3	6.7	9.4	3.8	4.6	22.6	20.4	100.0	100.0	106
First births	20.8	18.5	6.7	8.7	11.0	12.4	23.3	24.2	4.2	3.8	4.2	3.4	4.2	4.2	6.0	5.6	19.4	20.0	100.0	100.0	283
Total	21.6		10.4		10.1		18.0		7.0		3.8		4.8		4.4		19.8		100.0		1,618

Note: Sample size and unadjusted percentages are presented unweighted. Adjusted percentages were calculated using weighted logistic regression models which adjust for mother's age at birth, the survival status of the preceding pregnancy, maternal education, residence, wealth, and geographic remoteness.

*This interval was used as the reference category in the logistic regression models used to calculate adjusted percentages.

for children with either a short or long birth interval compared with children with the optimal birth interval of 24-35 months. The percentage of deaths due to sepsis, for example, is highest among births in both the shortest and longest birth interval range and lowest in the optimal birth interval of 24-35 months. In contrast, perinatal conditions appear to be a slightly more common cause of death for children with a birth interval in the optimal range compared with children with either short or long birth intervals.

Multivariate Analysis

Table 4 presents the adjusted risk of dying of specific causes by birth interval, for children dying under age 5. The relationship between the preceding birth interval and the causes of mortality is considered statistically significant for p-values less than 0.05. For example, among children whose preceding birth interval was <18 months, the adjusted risk of dying from ARI before reaching age 5 is 19 deaths per 1,000 live births (risk ratio = 0.019). In other words, of each 1,000 live births with a preceding birth interval shorter than 18 months, an estimated 19 children will die from ARI before reaching their fifth birthday.

After adjusting for birth order, mother's age at birth, survival status of the preceding pregnancy, maternal education, residence, wealth, and geographic remoteness, children with a previous birth interval of less than 18 months have a higher risk of dying from some causes of death than children with a previous birth interval of 24-35 months (the reference category). The rate of dying from sepsis by age 5 is significantly higher (p=0.036) among children with a preceding birth interval<18 months than among children with a preceding birth interval of 24-35 months. Similarly, the risk of dying before reaching age 5 due to diarrhea is significantly higher among children with a preceding birth interval <18 months than among children with a birth interval of 24-35 months (p=0.003), after adjusting for background characteristics. Overall, the risk of dying from causes in later young childhood is more than twice as high among children with a preceding birth interval of less than 18 months as among children with a preceding birth interval of 24-35 months.

Children also have an elevated risk of dying from some specific causes of death if the preceding birth interval was at least 60 months. This pattern is significant for the diarrhea-specific adjusted mortality risk (p=0.037) and the lowbirth weight/preterm-specific adjusted mortality risk (p=0.039), such that the adjusted risk of dying due todiarrhea and low birth weight is significantly greater among children with a preceding birthintervalof 60+ monthsthan among children with a preceding birth interval of 24-35 months.

Table 4. Adjusted risk of dying by specific causes and birth interval among children dying before age 5, Afghanistan 2010

	Cause-specific mortality risk (p-value in parentheses)											
Birth interval	**ARI**	**Diarrhea**	**Sepsis**	**Perinatal conditions**	**Injury**	**Congenital**	**Low birth-weight / preterm**	**Mal-nourished**	**Other causes**	**Early in life causes***	**Causes in later young childhood***	**N**
<18 months	0.019 (0.107)	0.012 (0.003)	0.012 (0.036)	0.017 (0.100)	0.006 (0.219)	0.004 (0.080)	0.006 (0.052)	0.004 (0.186)	0.018 (0.117)	0.026 (0.066)	0.053 (0.042)	342
18-23 months	0.013 (0.207)	0.010 (0.007)	0.005 (0.408)	0.008 (0.440)	0.005 (0.232)	0.003 (0.096)	0.001 (0.587)	0.003 (0.204)	0.012 (0.252)	0.012 (0.411)	0.035 (0.106)	243
24-35 months (Reference)	**0.010**	**0.004**	**0.005**	**0.009**	**0.004**	**0.002**	**0.002**	**0.002**	**0.010**	**0.013**	**0.024**	354
26-47 months	0.015 (0.103)	0.006 (0.080)	0.005 (0.413)	0.006 (0.525)	0.005 (0.306)	0.002 (0.269)	0.003 (0.151)	0.002 (0.366)	0.011 (0.286)	0.012 (0.411)	0.033 (0.135)	196
48-59 months	0.015 (0.131)	0.007 (0.081)	0.004 (0.461)	0.010 (0.308)	0.006 (0.171)	0.001 (0.509)	0.003 (0.234)	0.002 (0.439)	0.010 (0.352)	0.014 (0.304)	0.034 (0.141)	94
60+ months	0.012 (0.311)	0.009 (0.037)	0.010 (0.080)	0.012 (0.249)	0.004 (0.449)	0.002 (0.257)	0.006 (0.040)	0.003 (0.196)	0.015 (0.189)	0.019 (0.169)	0.038 (0.160)	106
First births	0.015 (0.192)	0.007 (0.105)	0.010 (0.088)	0.020 (0.037)	0.003 (0.578)	0.003 (0.186)	0.003 (0.246)	0.005 (0.076)	0.016 (0.153)	0.026 (0.054)	0.040 (0.180)	283
Total												**1,618**

*Causes early in life include perinatal conditions, congenital, low birth weight/preterm; causes in later young childhood include ARI, diarrhea, sepsis, and malnutrition.

Discussion

The 2010 Afghanistan Mortality Survey (AMS 2010) indicates that more children in Afghanistan are living past their fifth birthday than at any time in the past. Fewer women are dying during pregnancy and childbirth than previously reported. Despite these improvements, one Afghan child in every 10 dies before age 5, and one in every 13 dies within the first year after birth.

The survey shows that fertility rates have declined and more women are using family planning. Still, Afghanistan has higher fertility and lower levels of contraceptive use compared with regional and neighbouring countries such as Bangladesh, India, and Pakistan. Afghan women now give birth to about five children, on average, over the course of their reproductive years. As we might expect, given that most Afghan women have many births, short birth intervals are common: one-third of all births in the eight years preceding the 2010 AMS occurred after a birth interval of less than two years, while 42% of all children who died before reaching age 5 were born within two years of a preceding birth.

Surveillance reports in the country have shown that acute respiratory infection (ARI) and diarrheal diseases are the leading causes of death among children under age 5 (DEWS 2011). The present study, however, using AMS data found that ARI and perinatal conditions are the leading causes of death for children under age 5 (at 22% and 18%, respectively), followed by diarrheal disease and sepsis (at 10% each) (Rasella et al. 2010).

For the first time, the current study establishes a relationship between birth intervals and cause-specific child mortality. The findings suggest that children born with non-optimal birth intervals (<18 months or 60+ months) may be particularly vulnerable to certain causes of death, including diarrhea, sepsis, low birth weight, perinatal conditions, and ARI (for ARI and perinatal conditions, the pattern is visible but not statistically significant). Avoiding births with very short or long birth intervals would likely reduce the risk of dying due to such health problems.

Children with a birth interval less than 18 months have a significantly higher risk of dying due to sepsis than children born an optimal 24-35 months after a preceding birth. Sepsis is a major problem among children in Afghanistan, which could be reduced by achieving or coming closer to the optimal interval. The significant relationship between short birth intervals and under-five mortality from diarrheal diseases and low-birth weight/preterm causes is a trigger point for program managers and policymakers to align efforts to reduce child mortality with efforts to encourage optimal birth spacing.

According to findings of this study, long birth intervals also present a higher risk of under-five mortality, significantly so for diarrhea-specific adjusted mortality risk and low-birth weight/preterm-specific adjusted mortality risk. That is, both extremely short and long intervals between pregnancies put children at a higher risk of dying young. Studies on child mortality and its causes support such findings (Ghosh 2012). Policymakers should focus on control and prevention of sepsis, which could lead to considerable reduction in child and newborn mortality. This focus, and particularly better care for infants born at home, has been shown to avert most deaths among newborns in rural India (Bang et al. 1999).

The AMS 2010 provides a rich dataset that can be analyzed and used to generate new information for planners, program managers, and policymakers. This study, which combines data from the survey on causes of death with other covariates of the risk of death of children under age 5, has shown mechanisms by which the length of birth

intervals may be related to the risks of dying in childhood. In particular, the length of birth intervals is significantly related to mortality risk from diarrhea, sepsis, and low birth weight. Further analyses in other settings are needed to confirm the generalizability of these conclusions and to establish whether children with non-optimal birth intervals are more likely to contract these diseases or to have higher case fatalities, or both.

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Annex 1: Neonatal, postneonatal, infant, toddler (12-13 months), child (24-59 months), child (12-59 months), and under-five mortality rates* for the eight-year period preceding the survey, Afghanistan 2010.

	N	Neonatal Mortality	Post-neonatal Mortality	Infant Mortality	Toddler (12-23 months) Mortality	Child (24-59 months) Mortality	Child (12-59 months) Mortality	Under-Five Mortality
Birth interval								
< 18 months	1,979	35.8	45.5	81.9	8.5	9.6	17.8	99.2
18-23 months	13,547	17.6	25.5	43.3	7.8	8.4	15.9	58.6
24-35 months	13,542	16.1	19.9	36.3	5.6	5.1	10.7	46.6
26-47 months	5,540	14.3	26.0	40.1	7.7	9.3	16.7	56.0
48-59 months	2,264	15.9	26.8	42.5	7.6	11.3	18.4	60.0
60+ months	2,122	23.1	37.5	60.5	5.9	7.7	13.3	73.4
First births	8,082	32.4	29.9	63.5	5.3	4.5	9.8	73.2
Total	**47,076**	**20.3**	**26.2**	**46.7**	**6.7**	**7.0**	**13.5**	**59.8**

* Rates may not match those presented in the 2010 Afghanistan Mortality Survey due to the non-standard eight-year reference period used in this study.

Reproductive Cancer Risk Factors among Relatives of Cancer Patients in a Tertiary Oncology Center

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Abstract

Objective: The aim of this study was to evaluate the prevalence of some gynecological cancer risk factors in a population of female relatives of cancer patients in Hacettepe University Oncology Hospital.Additionally, what are the levels of the women's awareness/behavior toward available screening tools?

Method: An individual cancer risk assessment questionnaire has been developed in the Department of Preventive Oncology, which questions the medical history, health behaviors and cancer awareness, as well as their behavior toward available cancer screening tools.

Results: The mean age of the study population was 45.7±12.2 years. Median age at menarche was 13 years (IQR, 12-14), 6.9% of the women reported their menarche was before age of 12.About 11.1% of the women had intercourse before age of 18.The median age at first delivery was 22 years. Median BMI was 24.9, with 18.3% of population having obesity. Of the women 65% were current/past smokers. Sixty-two percent of the women had never used condom. About 8% of the women were unaware about mammography and 17.7% about the Pap test.

Conclusions: This study has documented high tobacco use, low protective condom use and low rates of physical activity. Percentage of some risk factors like early menarche was lower than what was suggested for general Turkish population.

Awareness and behavior of the women were better about mammography when compared to the Pap test. Considering our results, some measures should be put in place to increase people's awareness, and to modify their behavior toward cancer prevention.

چکیده

هدف این تحقیق ارزیابی شیوع یک تعداد ریسک فکتور های سرطان های نسایی در اقارب مریضان سرطانی که به بخش آنکولوژی شفاخانه هاجتپه (پوهنتون هاجتپه، شهر انقره، ترکیه) جهت تشخیص و تداوی مراجعه نمودند، علاوتاً سطح آگاهی و رفتار این خانم ها در مورد میتود های موجوده واقعه یابی سرطان ها مورد ارزیابی قرار گرفت.

میتود: در دیپارتمنت وقایه سرطان های این پوهنتون، یک سؤالنامه برای ارزیابی خطر معروضیت به سرطان ها تهیه گردیده که با استفاده از آن معلومات در مورد مشخصات دیموگرافیک، تاریخچه طبی و دوایی، طرز زندگی و بلاخره آگاهی و رفتار اقارب مریضان سرطانی در مورد میتود های موجوده واقعه یابی سرطان ها جمع آوری گردید.

نتایج: در مجموع ۵۹۵ خانم درین تحقیق اشتراک کردند که اوسط سن شان ۴۵.۷ با انحراف معیاری یا ۱۲.۲) SD) سال بود. حد اوسط سن اولین عادت ماهوار (مینارش) ۱۳ سال (۱۴-۱۲، IQR) دریافت گردیده ۶.۹ فیصد خانم ها اولین عادت ماهوار شان را قبل از ۱۲ سالگی تجربه نموده اند. یازده فیصد شان از رابطه جنسی مقدم (قبل از سن ۱۸) حکایه داشتند. سن وسط در اولین ولادت شان ۲۲ سال دریافت شد. حد وسط BMI شان ۲۴.۹ بوده و ۱۸.۳ فیصد خانم های مشمول این تحقیق چاق بودند.

شصت و پنج فیصد اشتراک کننده گان تاریخچه مثبت (قبلی/ فعلی) سگرت کشیدن را داشتند. شصت و دو فیصد شان گفتند که در هنگام روابط جنسی همسر شان هیچگاهی از کاندم استفاده نکرده است. ۸ فیصد اشتراک کنندگان اصلاً در مورد مموگرافی آگاهی نداشتند در حالیکه این رقم برای Pap test بالاتر (۱۷.۷ فیصد) دریافت گردید.

نتیجه گیری: درین تحقیق فیصدی بلند استفاده از سگرت، پایین بودن سویه فعالیت فزیکی منظم و استفاده محافظتی از کاندم دریافت گردید. فیصدی یک تعداد ریسک فکتور های دیگر مانند مینارش مقدم در مقایسه به آنچه که نزد نفوس ترکیه متصور است، کمتر دریافت گردید. . در مقایسه با تست پاپ آگاهی و سلوک اشتراک کنندگان در مورد مموگرافی بهتر بود. با در نظر داشت نتایج این تحقیق اقداماتی جهت وقایه ابتدایی و ثانوی سرطان ها مانند آگاهی دهی و تشویق مردم به طرز زندگی صحی، چگونگی کارکرد میتود های واقعه یابی و غیره روی دست گرفته شود.

Introduction

Cancer by causing 8.2 million deaths in 2012 is one of the leading causes of death worldwide. Globally, there were 14.1 million new cases of cancer, and 32.6 million people living with cancer in 2012 (World Health Organization [WHO], 2014). According to WHO, the number of cancer cases will reach 24 million a year by 2035, but half could be prevented. Gynecological cancers, which primarily originate from ovaries, uterine corpus, uterine cervix, vulva and vaginal tissues, represent more than 16% of all cancers. Its age standardized incidence rate is about 29/100,000/year. In Turkey, the rate of gynecologic cancers is 21.3 (WHO, 2014).

Overall etiology of gynecologic cancers is not well understood. However, some of risk factors are known for these cancers. Some of the risks are modifiable like obesity, hormone therapy, age at first sex, age at first birth, number of sex partners. While some others are not for example age, familial history of cancers (National Cancer Institute [NCI], 2014). On the other hand, some factors have an increasing effect to almost all gynecologic cancers such as: age, hormone therapy, obesity, and others (Watson et al, 1994; Aarnio et al 1995). While some others may have different effect; such as parity, which increases the risk of cervical cancer but decreases the risk of endometrial cancer (Dossus et al, 2010; Luna et al, 2004). The distribution of risk factors for gynecologic cancers as well as other cancers is not same in all parts of the world (Watson et al, 1994). Assessing cancer risk in average and high-risk people is essential for primary prevention and early detection of cancers in women. The evidences indicate that in some cancers by taking preventive measures, screening and early detection almost all cases can be prevented primarily and secondly (Luna et al, 2004; Schiffman et al, 1993). In Turkey, to our knowledge, there has not been done a risk assessment study yet. To do risk assessment, defining the risk factors' prevalence in a particular population is vital. The aim of this study is to evaluate the prevalence of some reproductive cancer risk factors in a population of female relatives of cancer patients seeking treatment in Hacettepe University Oncology Hospital. Additionally, what are the levels of the women's awareness /behavior toward available screening tools?

Methods and Participants

This is a cross-sectional study, which has been done in Hacettepe University Cancer Institute's Preventive Oncology Department. A cancer risk assessment questionnaire had been designed by the Department of Preventive Oncology and filled by relatives of cancer patients coming to the Hacettepe University Oncology Hospital in order to be diagnosed and/or treated. Answering to the questionnaire was voluntary. The questionnaire was completely self-administrated. By the end of 2012 the data was collected. Data of 595 women have been included in this study.

In this study, we primarily measured frequencies of specific risk factors for gynecologic cancers. In addition, level of women's awareness of available screening tools and their behavior toward them has been measured.

All variables were categorized into demographics, personal reproductive, personal/familial medical and drug history, and behavior/awareness categories for analysis.

SPSS 22.0 package was used for data analysis. To analyze data, first descriptive statistical methods have been applied. Mean ± standard deviation or median (IQR) has been calculated and used for representation of the quantitative data considering their distribution types. For categorical data frequencies and percentages were calculated. To compare groups of data; for normal distributed two independent groups, the independent samples t-test was conducted and ANOVA in case of more than two groups. The Tukey test was used for subgroup analysis. For non normally distributed data, Mann- Whitney-U for two groups or Kruskall-Wallis tests for more than tow group were conducted. Chi-square and Fisher's tests were used to determine the association between categorical data. To test the significance of the pair-wise differences Bonferroni correction was used to adjust for multiple comparisons. The significance level was set at $p<0.05$.

This study was approved by the Hacettepe University Ethical Committee (decision # GO 14/ 04 – 06).

Results

This study included a total of (n = 595) women with a mean (SD) age of 45.7 (12.2) years (ranged from 15 to 86) at the time of replying to the questionnaire. The majority (68%) of the women was currently married. Summary descriptive values for demographic variables are given in Table 1.

Median menarche age of the women in this study was 13 (IQR, 12-14). Only 6.9% of them reported menarche before age 12 (Table 2). Moreover, 18.9% of the women reported irregular menstrual bleeding.

The median age of first sexual activity was 21 (IQR, 18 to 24), and 18% reported early sexual activity (at age < 18 year).

The majority (76%) of participants had been at least once pregnant in their lifetimes. The median age of the first delivery in this study was 22 (IQR 19 to 26), and the median number of deliveries in our study population was 2 (IQR, 2 to 3). Only 9.2% of the women reported their first delivery age younger than 18 years (Table 2).

Median BMI of our study population was 24.9. According to the observed BMI 18.3% of women in our study were obese and 31.1% of the women were overweight.

7% of them were cancer survivors, while 14.3% of them were hypertensive and 6.2% of the women were diabetic. Of the women 17.6% reported hormone replacement therapy (HRT), and 26.3% of them had used OCP, while prevalence of tamoxifen usage was 2.8%. For details see Table 3.

Majority (64.6%) of the women reported themselves as current or past cigarette smokers.

Answering about their sport habits, about half (49.2%) of the women, who answered this question said they never do sport.

About 11% of the women reported more than one sexual partner. Considering the available data about condom usage, 62.1% of them had never used it. About 8.1% of the women had no awareness about mammography. Seventeen percent of the women participating in this study had no awareness about Pap smear. More details are given in table 4.

To compare the age of menarche in different age groups, median age at menarche did not vary sig-

nificantly among the groups of women participating in this study (Table 5).

After comparing BMI of women having regular menstruation with women of the irregular menstruating group, it was found that, women with irregular menstruation were more likely to have a higher BMI ($p<0.001$). Some other variations in BMI according other variable are given in Table 3.

Discussion

This study is an attempt to measure the frequency of specific gynecological cancers' risk factors in female relatives of cancer patients.

The mean (SD) age at interview of the participants was 45.7 (12.2) years and about 76% of the women were older than 35. In comparison to the general Turkish population - female median age of 29.6- the women participating in this study were older (WHO, 2014; Central Intelligence Agency [CIA], 2014). The proportion of current/past smokers in this study was higher than given proportion (overall 31.1%; female 15.2%) for Turkish general population (CIA, 2014). There could be some explanations for this difference, such as; higher median age, higher urbanization, and higher levels of education in our study population. However, as smoking is a modifiable cancer risk factor, to prevent cancers, the population should be motivated not to smoke, especially if they have some unmodifiable cancer risks e.g. family history of cancer.

Median menarche age was 13 years and it was higher than what Chumlea WC et al. found for U.S white girls whose median age at menarche was 12.6 years (Chumlea et al, 2003). Median age at menarche in the current study, however, confirms findings of Ekerbicer H C et al., in their study about age at menarche in adolescents in the Eastern Mediterranean city of Kahramanmaras, Turkey, who recorded age at menarche as 13 years (Ekerbicer et al, 2007).

In our study only 6.9% had early menarche (<12 years). For American girls this percentage was more than 10%. In 2009 Talma et al. reported that, 33% of Turkish girls living in Netherland had early menarche (Talma et al, 2013).

About 11% of participants reported sexual activity before age of 18. In 2005 Dagdeviren N et al. studied the sexual activity behavior among Turkish adolescent of median age of study population, 18 yrs, and found that, the median age of sexual activity in girls was 17 years, near to western countries (Dagdeviren et al 2008). The age distribution of our study population (median, 46 yrs.) was totally different from above mentioned study population, which can explain the difference in sexual behavior. Also, there is a possibility of changing sexual behavior over a period of time. That indicates need of further investigations for evaluating any changes of sexual behavior in the Turkish general population.

In this study median age at first delivery was 22 and the proportion of early delivery was 9.2%, which is higher than what is found in Europe (1% in Germany, 2% in France), consistent with the United States (10%) and lower than in Mali (45%), in Uganda (42%), and 25% for Ethiopia (Nawal & Nour, 2006).

Sixty-two percent of women in this study, said that they never use the condom, while, 9% always used it. Women with lower education levels had a lower rate of condom usage.

Women in this study had a median BMI of 24.9. Women in the obese group were significantly older compared to those with normal weight. We found that, obesity was more prevalent in non-smokers when compared to those who smoke. But, women with higher education at the level of university or more and higher income -more than 3000 Turkish Liras (TL)- had lower obesity percentages compared to the others. In addition a higher percentage of women with irregular menstrual

bleeding were obese and overweight compared normal menstruating women, the finding was statistically significant (Table 3).

About half of the women reported that, they never do sport. Compared to older women, those with younger age reported exercising less frequently. Considering our results, some measures should be put in place to educate people about exercise and healthy lifestyle.

About 7% (n=40) of the women had a positive past cancer history; breast cancer was the most prevalent.

All participants in this study came to the hospital with their relatives, who were cancer patients, but some of the cancer patients had no genetic relationship with the women i.e. husband and wife. As a result all of the women had not positive family history of cancer. About 66% of them had at least one family history of cancer in first degree relatives. Breast cancer had the highest (18.4%) proportion. Second most common cancer was lung cancer, colorectal cancer (9.8%) was the third, and gynecological cancers (4.6%) were the fourth most common type in their families.

About 8.1% of participants in this study were not aware of mammography; awareness about the Pap test was lower than mammography, 17.1% of the women had no awareness about Pap tests. Considering data about both available screening tools, we can say that the population should be made more aware of these tests.

This study had a nonrandom sampling design and was done on a population with a specific condition, the results could have some variations from what is valid for the general population. However, findings from this study will be valid for similar population groups, such as; relatives of cancer patients.

Considering our findings, there were a variety of reproductive cancer risk factors in female relatives of cancer patients. Some of them like aging, a family history of cancer, could not be prevented or modified while, some others could be modified to prevent cancer, such as; smoking, breast feeding, condom use, and exercise. As a measure of cancer prevention, the population's awareness about possible ways of the prevention should be increased. By increasing population's awareness, their behavior toward modifiable risks would mostly be changed. Finally, data from this study and similar studies can be used in developing cancer risk assessment tools, and strategies for cancer prevention.

Conclusion

Compared to the general population of Turkey, women participating in this study were more likely to be older. Percentage of some risk factors such as; early menarche, early sexual activity, and early child birth was lower than what was estimated in some other populations. While, the prevalence of others like obesity or some chronic disease were almost adherent to what is suggested for turkey population. However, this study has also documented high tobacco use and low protective condom use.

In addition, our findings support required efforts to increase general population awareness about available cancer screening tools. Also, there is a need for motivating women to use available screening tools according to their given protocols.

By modifying risk factors, many of the cancers can be prevented. The results of this study appear the requirement of smoking behavior, lifestyle and exercise modifications for cancer prevention.

The study provides information that will be useful for developing more specific and precise data collection tools specially for measuring risk factors of women's cancers.

Table 1. Summary descriptive values

Variable (valid data)	Group	Mean (SD)	N (%)
Age, yrs. (N=509)	≤ 35	29.4 (4.4)	121 (23.8)
Mean ± SD (45.7± 12.2)	36-55	46.2 (5.7)	276 (54.2)
	≥ 56	62 (5.2)	112 (22)
Marital status (N= 558)			
	Married		379 (67.9)
	Single		119 (21.3)
	Divorced		37 (6.6)
	Widow		23 (4.1)
Education (N=570)			
	≤ Intermediate		240 (35.7)
	High school		185 (32.5)
	≥ University		181 (31.8)
			33 (6.9)
Age at menarche (N=478)	Age 12-15		402 (84.1)
Median (IQR); 13 (12-14)	Age >16		43 (9)
Menstruation (N=518)			
	No		153 (29.5)
	Yes, regular		267 (51.6)
	Yes, irregular		98 (18.9)
Pregnancy (N=516)			
	Yes		392 (76)
	No		124 (24)
Age at first delivery (N= 336)			
median (IQR), 22 (19-26)	<18		31 (9.2)
	18- 29		265 (78.9)
	> 29		40 (11.9)
Number of Delivery (n= 334)			
Median (IQR); 2 (2-3)	≤ 2		230 (68.9)
	3 --5		95 (28.4)
	≥ 6		9 (2.7)
Breast feeding (N=502)			
	Yes		354 (70.5)
	No		148 (29.5)
Age at first intercourse (N=			
322) median (IQR), 21 (18-	≥18		264 (82)
24)	<18		58 (18)

Table 2. Summary descriptive values of personal/familial medical and behavior/ awareness variables

Variable (valid data)	Group	Median (IQR)	N (%)
BMI (N= 453) median (IQR) 24.9 (21,7-28.2))	Age ≤ 35	21.5 (20-24.2)	110(24.3)
	Age = 36-55	25.4 (22.2-28.7)	234(51.7)
	Age ≥ 56	26.9 (24-30)	88 (19.4)
Interpretation of BMI (N=453)	Normal (BMI ≤ 25)		229 (50.6)
	Overweight (25.1-30)		141 (31.1)
	Obese (BMI ≥ 30.1)		83 (18.3)
	Cancer		40 (7)
	Hypertension		85(14.3)
	Osteoporosis		47 (8)
	Diabetes		37 (6.2)
	Colorectal adenoma		7 (1.2)
Family history of cancer (N= 551)	Yes		363(65.9)
	No		188 (34.1)
Oral Contraceptive Pills (N=487)	Never		359(73.7)
	Yes, discontinued	2 yrs. (1-4.5)	98 (20.1)
	Yes, currently	3 yrs. (1-5.5)	30 (6.2)
Tamoxifen (N=433)			
	Never		421(97.2)
	Yes, discontinued	5 yrs. (3.5-5)	5 (1.2)
	Yes, currently	3 yrs. (1-3)	7 (1.6)
H/O STDs (N=470)			
	No		458(97.4)
	Yes		12 (2.5)
			320 (64.6)
Smoking (N=495)	No		175 (35.4)
Number of sex partners (N=298)			
	One		265 (88.9)
	2--4		27 (9.1)
	> 4		6 (2)
Condom use (N= 377)			
	Never		234 (62.1)
	Sometimes		79 (21)
	Often		30 (8)
	Always		34 (9)
H/O Mammography (N=480)			
	No awareness		39 (8.1)
	No, don't want to do		159 (33.1)
	No, going to do		89 (18.5)
	Yes, will not repeat		91 (19)
	Yes, will repeat		102 (21.3)
H/O Pap test (N=479)			
	No awareness		82 (17.1)
	No, don't want to do		133 (27.8)
	No, going to do		49 (10.2)
	Yes, will not repeat		106 (22.1)
	Yes, will repeat		109 (22.8)

Table 3. BMI variations according other variable

	N	BMI - N (%)			
		< 25	25.1-30	> 30.1	P- value
Chronic Diseases					
- Diabetes	27	1 (3.7)	11 (40.7)	15(55.6)	P<0.001
- Hypertension	69	15 (21.7)	21 (30.4)	33(47.8)	P<0.001
- Osteoporosis	39	18 (49)	10(25.6)	11 (28.2)	P=0.202
Menstruation					
- Regular	240	129(63)	55(27)	20 (10)	P<0.001
- Irregular	74	36 (48.6)	23 (31.1)	15 (20.3)	
Marital status					
- Single	90	71 (78.9)	14 (15.6)	5 (5.6)	P<0.001
- Married	297	131(44)	107 (36)	59 (19.9)	
- Divorced	32	14 (43.8)	9 (28.1)	9 (28.1)	
- Widow	19	7 (36.8)	5 (26.4)	7 (36.8)	
HRT					
- No	134	50 (37.3)	48 (35.8)	36 (26.9)	P=0.522
- Yes	31	15 (48.4)	6 (19.4)	10 (32.2)	
OCP					
- No	275	139(50)	83 (30.7)	53 (19.3)	P=0.623
- Yes	105	57 (54.3)	29 (27.6)	19 (18.1)	
Cancer in family					
- No	150	83 (55.3)	42 (28)	25 (16.7)	P=0.128
- Yes	76	130(47)	91 (33)	55 (19.9)	
Smoking					
- No	129	58 (45.5)	38 (30.2)	32 (24.3)	P=0.035
- Yes	255	140(55)	78 (30.6)	37 (14.5)	
Monthly income					
- < 500	25	10 (40)	11 (44)	4 (16)	P=0.019
- 500-1000	127	52 (40.9)	45 (35.4)	30 (23.6)	
- 1000-3000	221	117(53)	64 (29)	40 (18.1)	
- >3000	44	31 (70.5)	10 (22.7)	3 (6.8)	

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Prevalence and Determinants of Appropriate Knowledge, Attitude and Practices Regarding Polio in Six Provinces of Afghanistan

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Abstract

Introduction: The primary objective of the study was to determine prevalence of appropriate knowledge, attitude and practice (KAP) among parents/caregivers of under-five children regarding polio in six selected provinces.

The secondary objectives were, to determine prevalent sources of communication among target population, to determine factors associated with different level of knowledge among Parents/caregivers in six selected provinces of Afghanistan, and to look into change in knowledge attitude and practice among caregivers from KAP1.

Method: A cross sectional study design was used for achieving the study objective. This study was conducted in the six provinces of Afghanistan, namely Nangarhar, Laghman, Kandahar, Helmand, Farah, and Baghlan . The target population for the study was adults aged 18 to 60 years residence of the mentioned provinces. The participants selected using multistage stratified cluster sampling procedure. The sample size was 846.

Results: We collected data from 846 caregivers/parents in six provinces under study. Almost 100% selected caregivers/parents consented to participate in the study except for 3 in Kandahar. The level of knowledge regarding polio was poor, i.e 16.4%, 32.8%, 47.7%, 26%, 61.4% and 19% in Nangarhar, Laghman, Kandahar, Helmand, Farah and Baghlan provinces, respectively.

The participants' awareness regarding polio was 83.3%, 62.5 %, 53.2%, 71.2%, 39.1%, and 81% in Nangarhar, Laghman, Kandahar, Helmand, Farah and Baghlan provinces, respectively (P-value <0.001). Most frequent sources of information related to polio reported by participants were Radio (35.8%), TV (22.9%), Banners/Poster (16.5%) and vaccination teams (10.4%). The main community source of information on polio was Community Health Workers (55%), elders (15.1%), while the rests were Mullahs and teachers.

Conclusion: The findings of this study showed poor knowledge (30%) of participants towards polio. Moreover, participants from Farah and Kandahar provinces had poor knowledge on polio compared to other provinces. Sources of frequent means of delivering/imparting information regarding polio were radio and television in the study area.

ارزیابی سطح دانش، طرز دید و عملکرد مناسب راجع به پولیو در شش ولایت انتخاب شده

چکیده

معرفی: هدف اولیه تحقیق، ارزیابی سطح دانش، طرز دید و عملکرد مناسب والدین/پرستاران اطفال کمتر از 5 سال راجع به پولیو در شش ولایت انتخاب شده میباشد اهداف ثانوی عبارت بودند از، ارزیابی منابع رایج مفاهموی در میان نفوس مورد هدف، تعین عوامل مرتبط به سطوح مختلف دانش در میان والدین/پرستاران در شش

ولایت انتخاب شده افغانستان، و مطالعه تغیرات بوجود آمده در سطح دانش، طرز دیدو عملکرد پرستاران بعد از عملی شدن پروگرام 1.

روش تحقیق: بخاطر بدست آوردن اهداف تحقیق از شیوه مقطعی (Cross Sectional) استفاده نمودیم. این مطالعه در شش ولایت افغانستان، ننگرهار، لغمان، قندهار، هلمند، فراه و بغلان راه اندازی شده بود. نفوس مورد هدف در این تحقیق افراد کاهل بین سنین 18 الی 60 سال ساکنان ولایات متذکره بودند. اشتراک کننده گان به وسیله نمونه گیری (Multi Stage Cluster Sampling) انتخاب شده اند.

تعداد 864 اشخاص شامل تحقیق گردیدند.

نتایج تحقیق: ارقام از 846 پرستار/والدین شش ولایت افغانستان جمع آوری شده اند.به استثنای 3 تن در ولایت قندهار، رضایت تمامی(تقریباً 100%) پرستاران/والدین انتخاب شده برای تحقیق، اخذ شده بود.

از نتایج مطالعه چنین بدست آمد که سطح آگاهی اشتراک کننده‌گان در مورد مرض پولیو پایین بوده و فیصدی این اشخاص در هر ولایت بالترتیب در ولایت ننگرهار به 16.4%، لغمان 32.8%، قندهار 47.4%، هلمند 26%، فراه 61.4% و در بغلان به 19% میرسید.

فیصدی آگاهی اشتراک کننده گان در مورد پولیو در ولایات ننگرهار، لغمان، قندهار، هلمند، فراه و بغلان بالترتیب به 83.3%، 62.5%، 53.2%، 71.2%، 39.1% و 81% می رسید (P-value <0.001). طبق گزارشات، منابع مهم معلوماتی اشتراک کننده گان در مورد پولیو عبارت بودند از رادیو (35.8%)، تلویزیون (22.9%)، بنر / پوستر (16.5%) و تیم واکسیناسیون (10.4%). منبع اصلی معلومات در سطح جامعه در مورد پولیو؛ کارمندان صحت جامعه (55%)، بزرگان (15.1%)، ملا و اساتید بود.

نتیجه: در ساحات مورد مطالعه، در حدود 30 فیصد افراد در مورد پولیو دانش کم داشتند که یک رقم قابل ملاحظه است و بیشتر این افراد در ولایات فراه و قندهار بودند. منابع عمده افهام و تفهیم در مورد پولیو در ساحات مورد مطالعه، رادیو و تلویزیون بود.

Introduction

Poliomyelitis is a highly infectious viral disease which attacks the nervous system. Children less than five years of age are the most vulnerable group to the disease; luckily timely vaccination can forestall the infection. Approximately one out of every 200-400 children infected by polio will suffer from paralysis and even death.

Since the Global Polio Eradication Initiative (GPEI) momentous launch, nearly five million children have been secured from being paralyzed and incapacitated by polio, now they are walking and symptoms free. The number of polio cases reported annually has decreased by over 90% from 350,000 in 1998 to 1,503 cases as of 15 December 2009. This fast success has been availed through a global campaign to immunize children through mass campaigns known as National Immunization Days (NIDs).

However, Afghanistan still remains one of the four endemic and re-infected countries i.e. Afghanistan, Nigeria, Pakistan and India. These countries are accounted for 78% of all new polio cases.

Number of polio cases has fluctuated since 1996. The country has a history of protracted conflict, mass population movement and may be subject to erroneous community beliefs. The literacy rate is low especially among female caregivers. Vaccination campaigns are conducted on National Immunization Days (NID), sub-national immunization days (SNID) and “mop-up” campaigns. According to Expanded Program for Immunization (EPI) data, coverage of OPV has fallen below 95% in some villages and districts in 7 provinces; Kandahar, Helmand, Urozgan, Zabul, Nangahar, Laghman and Baghlan. As in the majority of Afghanistan, there is social upheaval, poor sanitary conditions, and in some areas, conflict. Difficult terrain and conservative cultural views pose formidable challenges to immunizing all eligible children in some provinces such as Kandahar, Helmand, Baghlan, Laghman, and Nangarhar.

Despite the progress that has been made since 1996, however, completely eradicating the disease needs responsive communication support for all immunization rounds. Constructing effective communication system depends upon having quality information and understanding of local knowledge and attitudes towards polio, and this information was gained through first phase of household survey. UNICEF has conducted the second

phase of study in selected areas of Afghanistan. In the second study two more provinces were included which were not surveyed in the first phase i.e. Helmand and Farah.

Objectives of the study

The Study primary objective was to determine prevalence of appropriate knowledge, attitude and practice among parents/caregivers of under-five children regarding polio in the six selected provinces.

The secondary objectives were

- Determine prevalent sources of communication among target population in the six selected provinces of Afghanistan
- To determine factors associated with different level of knowledge among parents/ caregivers in six selected provinces of Afghanistan.
- To determine the changes in knowledge attitude and practice among care givers from KAP1.

Method

Study Design: A cross sectional study design was applied to achieve the study objectives.

Study setting: Study was conducted in six provinces of Afghanistan i.e. Nangarhar, Laghman, Baghlan, Kandahar, Farah and Helmand (for detail of districts and villages see annex).

Study Population: Women and men aged 18 to 60 years were our study population.

Sample Size: Sample size was calculated using Epi-info software version 9. As we were looking for the prevalence of appropriate knowledge, attitude and practice therefore, we have considered the prevalence of mentioned parameters to be 0.5 to have the largest sample size and is applicable for multiple variables, type one error of 0.05 and bound on the error of 0.05 were considered. We used multi stage cluster sampling technique for participants' selection, therefore, we considered design effect of 2 to adjust for variation due to not using random sampling, and none response rate of 10% was considered, the final sample size was 846.

Sampling procedure: The sample size was assigned through PPS method. Each Province was divided into two strata i.e. high risk districts and low risk districts. By High risk districts we meant those districts where polio virus was in circulation or cases were detected this or last year, having high density population or located in the border areas where there is high cross border traffic.

One district was randomly selected from high risk stratum and one district was randomly selected from low risk stratum. Then two villages were randomly selected from the frame of villages of each selected district. The variables measured were related to socio demographic, knowledge, attitude, practices, means of communications and reasons for missed children.

Data collection procedure: The survey teams were consisted of two male and two female data collectors and one supervisor in each province. They received training on the principles of closed ended interviews, data collection procedures, inconsistency checkups, field data management and supervision. Two days training were given to data collectors and supervisors, followed by one day field test, and based on field test's findings changes were made accordingly. The team visited the selected villages and met with key persons of the village, and village leaders were briefed on study objectives. Thereafter, study team marked numbers on the doors of all households in the village and then randomly selected the determined number of households from each specific village. The survey teams visited the random selected households in the way that they found out how

many members of the household were eligible for interview, afterwards they randomly chose one for interview, then based on the sex of the selected individual for interview, the interview was made with him/her through same sex data collector.

The data was collected through structured questionnaire by face to face interview with the selected individuals.

Data collection was supervised by supervisors, research officers, advisors of the study and PI. The questionnaires were transferred to the central office in locked boxes immediately after completion of data collection.

Data Editing, Entry and Management: After completion of daily interviews, each questionnaire was edited by the supervisor and research officers on daily basis. For any missing or incorrect information, forms were sent back to the interviewers for the corrections on the very next day. The second editing was done before the data entry and corrections were made accordingly.

After edition, data were double entered by two separate data entry operators into Epi-data 3.1 software. The two datasets were then compared for consistency and missing values. Any discrepancies were removed by referring to the physical files. Database was developed in Epi Data version 3.1. Data was analyzed using SPSS software. Mean and standard deviations were calculated for quantitative variables. Proportions were calculated for polio knowledge and all other qualitative variables (Nominal and Ordinal).

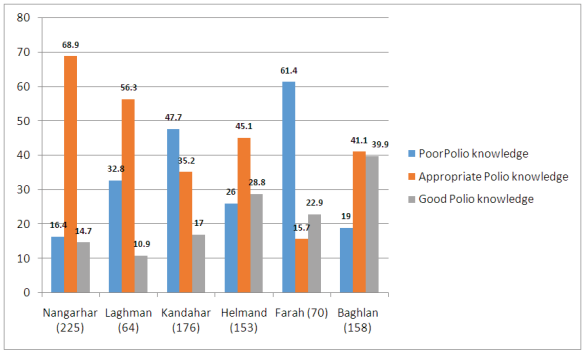
Ethical considerations: Study was approved by Institutional Review Board (IRB), Ministry of Public Health Afghanistan. The participants were briefed on the objectives and method of the study. Written informed consents were obtained from all participants before conducting the interview.

Results

We collected data from 846 caregivers/parents in the six provinces under the study i.e. Nangarhar, Laghman, Kandahar, Helmand, Farah and Baghlan. Almost 100% selected caregivers/parents consented to participate in the study except for 3 in Kandahar. The reason for their refusal was security concerns.

KAP1 study was conducted in four provinces namely Baghlan, Nangarhar, Kandahar and Laghman with a sample size of 440.

Figure 1: Knowledge of polio



Polio Knowledge

We calculated a composite score for polio knowledge from different questions related to the knowledge and came up with three categories i.e. poor (score, less than one standard deviation below the mean), appropriate (score laid in the range of one standard deviation around the mean) and good knowledge (score of one standard deviation above the mean). The level of knowledge on polio was 16.4%, 32.8%, 47.7%, 26%, 61.4% and 19% in Nangarhar, Laghman, Kandahar, Helmand, Farah and Baghlan provinces, respectively. Percentage of participants' awareness regarding polio was 83.3%, 62.5 %, 53.2%, 71.2%, 39.1%, and 81% in Nangarhar, Laghman, Kandahar, Helmand, Farah and Baghlan provinces respectively (P-value <0.001). In KAP 1, it was found that 74% of interviewees had heard about polio but in second round this percentage was dropped to 69.2%.

Figure 2: Polio treatment

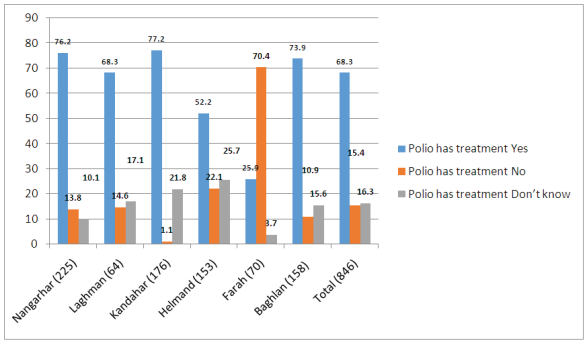
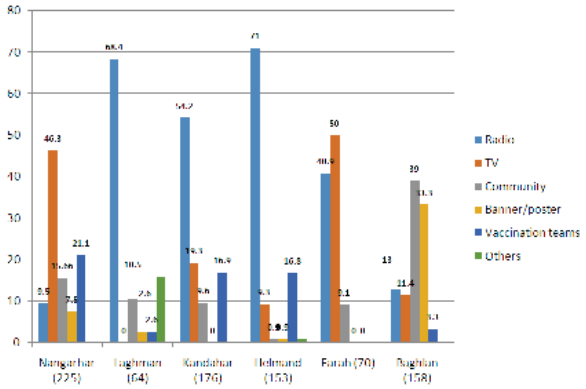


Figure 3: Sources of Polio Communication



Polio Communication

Most frequent sources of polio information were radio (35.8%), TV (22.9%), banners/poster (16.5%) and vaccination teams (10.4%). In KAP2 main source of information related to polio was radio, however, during KAP1 community was the main source of information for polio.

About 61 percent of participants received information from community sources regarding polio. The main source within community was Community Health Workers (55%), second source was elders (15.1%) and third and fourth community sources were Mullah and Teachers, respectively. In both studies i.e. KAP1 and KAP2 the main source of information within the community was community health workers.

In KAP1 65.7% people knew that polio is preventable but this knowledge was increased in KAP2 i.e. 83.7%. In KAP1 78.2% respondents knew that polio can be prevented by vaccine and in KAP2 this proportion has increased to 92.6%. In this survey 68.3% respondents said that polio has treatment, 16.3% told that they do not know and 15.4% knew that it is not treatable disease. However, in KAP1 53% of the respondents told that polio is treatable disease, 27.5% of the respondents told that they do not know whether or not polio has treatment and only 18.6% knew that it is not a treatable disease.

Participants were asked when children should not be given polio vaccine and they pointed out that newborn, sick, sleep, paralyzed (due to polio) should not receive OPV, their responses were 12.8%, 13.8%, 4.3% and 11.7%, respectively, and remaining 11.2% and 44.4% participants reported that they do not know and all children should receive polio vaccines respectively. Participants' knowledge regarding effectiveness of polio vaccine in polio prevention was 84.5%, 90.6%, 79.7%, 75.4%, and 96.8% in Nangarhar, Laghman, Kandahar, Helmand, Farah and Baghlan provinces respectively. For further information please refer to Table2.

Polio Campaign

The awareness of polio campaign in the adult population of all six provinces was 79.6%, with the highest awareness was in Nangarhar province (96.8%) and the lowest was in Helmand province (63.4%), the awareness of campaign was significantly different among the provinces (P-value <0.001). During last campaign, the average stay of the team in the households was 7.5 minutes with standard deviation of 6.8 minutes. Forty seven percent of caregivers/parents were provided with polio information in the study area, the highest information was provided in Baghlan province (69.6%) and the lowest was in Farah province

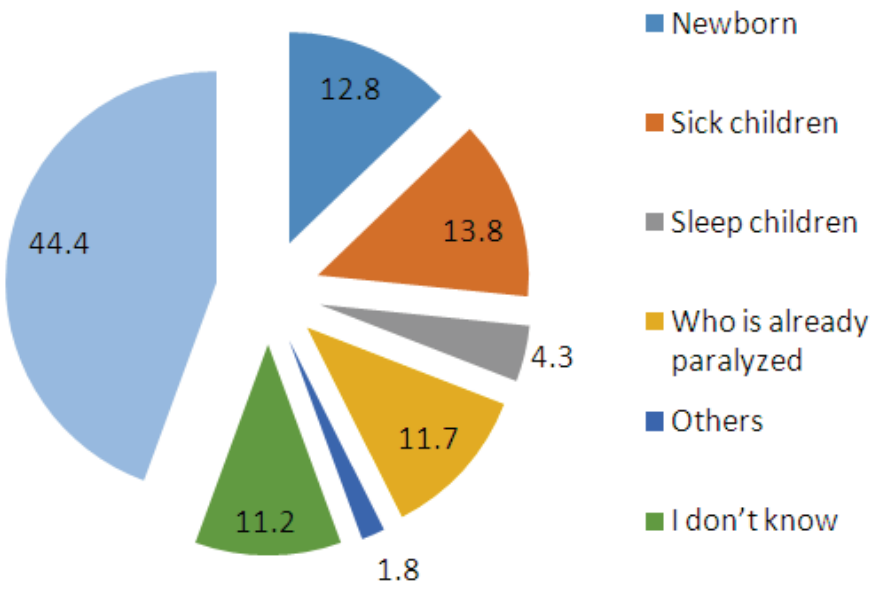
(14.7%), and the information provided by vaccinators during campaign were significantly different among the provinces. Majority of the participants responded if the vaccinator did not visit their households during the campaign they will take their children to the health facility for polio vaccine (56.3%) but in Kandahar, Farah, and Helmand provinces half of the participants responded that they will do nothing.

In KAP1 50.5% of the respondents knew about the polio campaign but this knowledge has increased to 79.6% in KAP2.

Believes and Attitude regarding polio: Participants were asked about efficacy of polio vaccine in prevention of polio, majority of the participants responded that vaccine can prevent polio (83.7%), and remaining 2% and 14.3% responded that the vaccine cannot prevent polio or they do not know, respectively. The participants' knowledge regarding polio vaccine in prevention of other diseases was assessed and 47.5% of participants believed that polio vaccine can prevent other diseases. Baghlan (79.1%) and Nangarhar (62.5%) provinces had higher proportion of participants who believed that polio vaccine can prevent other diseases. In the study area only 4.8% of the participants believed that polio vaccine is dangerous for their children and 19% of the participants replied that they do notknow about the danger of the polio vaccine, while remaining 76.2% of the participants responded that there is no danger associated with polio vaccine.

The reason for missed children were asked from the caregivers/parents, and the major reasons for the missed children identified were child was absent (39.6%), child was sick (17.7%), child was asleep (7.9%) and child was newborn (6.1%). In first round of the survey 65.7% of interviewees believed that polio is preventable while this percentage was 83.7% during the second round. In the first round 37.7% of interviewees believed that polio vaccine can prevent other diseases while this percentage was found a bit high i.e. 47.5% during the second round of the survey. In first round of

Figure 4: Children who should not get OPV (caregivers/parents opinion)



the survey 4.5% of interviewees believed that vaccine is dangerous while this percentage was 4.8% during the second stage of survey.

4.7 Reasons for missed children

As per caregivers/parents reports, ten percent of all the children did not receive OPV in the last polio campaign in the study areas.

In both studies the following were reasons for missed children:

1. The child was sick
2. The child was asleep
3. The child was not present at home
4. Child was newly born
5. The caregivers did not want to vaccinate their child

In the first phase of study, the percentage of the each category were 3.7%, 2.7%, 25.9%, 44.4% and 18.5% respectively. But this percentage was different in the second phase of the study as 17.7%, 7.9%, and 39.6%, 6.1%, 3.7% and 2.4% respectively. As it is obvious from the percentages itself that sick , asleep and absent children were more in second study but the percentage of care givers who did not want to vaccinate their children and other reasons were low in second study in compare to the first survey.

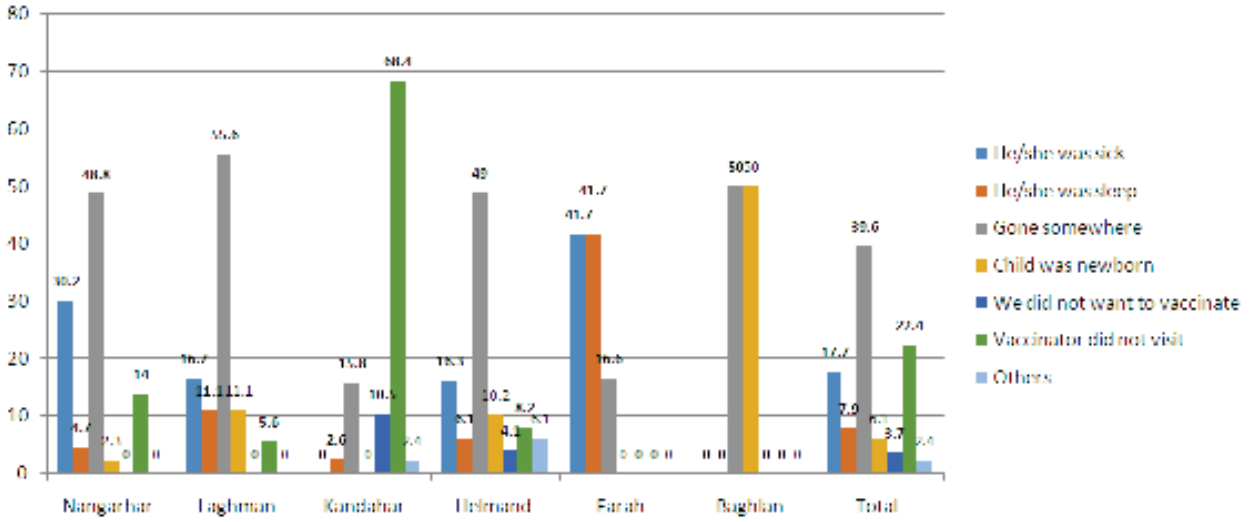
Figure 5: Reasons for missed children

Determinants of good polio knowledge: The participants were asked about washing hands after using toilet, 92.8% replied that they are washing their hands after using the toilet, but washing hands with the soap were 69.1%.

Univariate logistic regression analysis indicated that female had 60% higher polio knowledge as compared to males (Crude OR =1.6). One year increase in the education level showed increase in the polio knowledge by 10% (Crude OR=1.1). The CHWs were found to be the good community source for social mobilization in the study area (Crude OR =3.05) compared to Mullah.

Multivariable logistic regression analysis indicated the two variables are significant in the final model. The CHWs social mobilization was four times effective compared to Mullah (Adj OR=3.88, CI 1.44- 10.42). The middle economic class was as-

Figure 5: Reasons for missed children



sociated with the good polio knowledge (Adj OR= 2.68, CI1.25-5.77) compared to low economic class, and high economic class was also associated with good polio knowledge (Adj OR =2.51, CI 1.02-6.13) as compare to low economic class.

Table1: Multivariable Logistic regression analysis of Polio Knowledge

Name of variable	categories	Adjusted OR	CI		P-value
			LCI	UCI	
Number of adult population in		1.13	0.99	1.32	0.126
Years of education completed		0.933	0.87	1.001	0.054
From whom did you receive this information	Mullah	1			
	Teacher	3.303	.49	22.38	0.221
	Elders	1.02	0.37	2.78	0.977
	CHW	3.88	1.44	10.42	0.007
Economic Status	Low Economic	1			
	Middle economic	2.68	1.25	5.77	0.027
	High Economic	2.51	1.02	6.13	0.012

5. Conclusion:

Poor knowledge of polio was thirty percent in the study area, and it is a considerable number and the poor knowledge was higher in Farah and Kandahar provinces compared to other selected provinces. Sources of frequent means of delivering/ imparting information related to polio were radio and television in the study area. The perception of the caregivers/children regarding conditions of children who should not get polio vaccination was asleep, newborn and children who were already paralyzed with polio. Majority of caregivers/parents agreed that OPV can prevent polio. Campaign teams have provided information about polio to nearly half of the interviewed population. Study results recommended that Community health workers were more effective community source in imparting information regarding polio. In lower economic class polio knowledge was low. Awareness regarding polio campaign was different among the provinces, and reported low in Kandahar, Helmand and Farah provinces. A high proportion of population vaccinates their children when vaccinators pay visit to their homes. High proportion of interviewed population in Kandahar, Helmand and Farah provinces did not take any action when polio team did not visit their homes. The security was a major concern in Kandahar, Helmand and Baghlan.

Due to bad security situation, we could not conduct the survey in the two prior random selected districts of Helmand province, one district of Baghlan province and one district of Farah province; the mentioned districts were replaced with the comparative secured districts in the same provinces.

Recommendations:

- Strengthening the community sources of information particularly teachers, Mullahs, elders and CHWs.
- The Campaign teams should be well trained and take the task of providing information on polio to maximum numbers of households.
- Polio program should concentrate their attention towards poor population.
- Particular intervention should be devised to increase awareness regarding polio in Kandahar, Helmand and Farah provinces.
- Social mobilization program should establish such a mechanism which could tackle the existing negative attitude towards vaccinating their children if campaign team does not pay a visit to their homes especially in Kandahar, Helmand and Farah provinces.
- Social mobilization programs should enhance awareness regarding the safety and importance of polio vaccine.

Prevalence and Associated Factors of Hepatitis B, Hepatitis C and HIV Infection in Jalalabad City, Afghanistan

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ABSTRACT

Background: Hepatitis B, Hepatitis C and HIV infections are major public health problems worldwide. This study designed for dual aim of identifying risk factor for non-communicable diseases as well as determining the seroprevalence of HBV, HCV and HIV infection in an adult population in Jalalabad city, Afghanistan.

Method: By inclusion of 1200 adult subjects, a cross-sectional study was conducted in Jalalabad city within May-June 2013. Multistage random sampling technique was used to adult age group of 25-65 years. WHO STEPS approach used to collect data on demographic and behavioral factors. Blood samples were drawn biochemical measurements as well as serological test of Hepatitis B, Hepatitis C and HIV infection. Bivariate and multivariate analyses were performed using SPSS v.20.

Results: Out of 1200 subjects in study 60.9% were females and 39.1% males with a mean age of 38.78(SD 11.05) years (range 25–65 years). Approximately two thirds of participants (71.2%) were illiterate including those who were not enrolled in the education system and could not read and write. More than half of participants (53.4%) were housewives. Only 45 participants (3.8%) were seropositive for HBsAg on rapid test and 41 (3.4%) were confirmed positive after ELIZA test. Totally 11 subjects (0.9%) were seropositive for anti-HCV on rapid tests. Both infections coexisted in none of participants and no one was positive for HIV infection. By multivariate logistic regression analysis, independent predictors for HBsAg infection were being male (p value <0.01) traditional practice of tattooing (p value <0.05) and history of jaundice (p value <0.001).

Conclusion: The prevalence rate of HBV infection (3.4%) was comparable with other studies within and out of the countries whereas the prevalence rate of HCV (0.9%) is much lower in comparison to other studies. The prevalence of HBV infection was high in adult males, those with a practice of traditional tattooing and history of jaundice. There is a need to plan and conduct a national study to reflect the burden and formulate strategies for its prevention and control.

چکیده

پس منظر: امراض ویروسی التهاب کبد و انتان HIV از جمله مشکلات عمده صحت عامه میباشند. این مطالعه دو هدف را دنبال نموده است، طوریکه فکتور های خطر برای امراض غیر ساری را مشخص نموده و در عین زمان شیوع و فکتور های خطر ویروس های التهاب کبد و HIV را در شهر جلال آباد تشریح مینماید.

روش و مواد تحقیق: با شمولیت 1200 نفر افراد جوان، یک مطالعه عرضانی تحقیقی (STEP wise-WHO) در شهر جلال آباد در ماه جوزای سال 1392 راه اندازی گردید. با استفاده از نمونه گیری نوع خوشه یی افراد گروپ سنی 65-25 تحت مطالعه قرار گرفته و معلومات دیموگرافیک واجتماعی-اقتصادی با نمونه خون جهت معاینات سیروم در مورد امراض فوق از آنها جمع آوری شد. با استفاده از برنامه SPSS تحلیل های انفرادی و گروپی اجرا و گزارش داده شده است.

نتایج: از جمله 1200 نفر افراد تحت مطالعه، 60.9 فیصد مونث و 39.1 فیصد مذکر با اوسط عمر 38.78 و انحراف معیاری 11 سال بین گروپ سنی 25 تا 65 سال بودند. تقریباً دو ثلث (71.2 فیصد) بیسواد بوده که خواندن و نوشتن را بلد نبودند. بیشتر از نصف اشتراک کننده گان (53.4 فیصد) خانم های مصروف امور منزل ثبت شده اند. صرف 45 نفر یعنی 3.8 فیصد از نظر ویروسی کبدی نوع ((HBsAg مثبت بودند که با تست نوع ایلایزا 41 نفر یعنی 3.4 فیصد تایید گردیدند. جمعاً 11 نفر یعنی 0.9 فیصد برای انتی بادی ویروس نوع (HCV) با استفاده از تست سریع مثبت بودند. هر دو انتان در یک فرد بصورت مثبت دریافت نشد. با اجرای تست سریع مرض (HIV) هیچ فردی مثبت تثبیت نگردید. در نهایت با استفاده از روش تحلیل چند بُعدی فکتور هاییکه بصورت مستقل روابط موثق احصاییوی با امراض التهاب کبدی ویروسی نوع (HBV) داشتند عبارت از جنسیت مرد (p value <0.01) و عملکرد عنعنوی استفاده از خال کوبی (p value <0.05) و تاریخچه زردی (p value <0.001) میباشند.

نتیجه گیری: شیوع مرض ویروسی زردی نوع بی (3.4 فیصد) با سایر مطالعات منطقوی قابل مقایسه میباشد در حالیکه شیوع ویروس نوع سی (0.9 فیصد) در مقایسه با سایر مطالعات بسیار کمتر است. شیوع مرض زردی ویروسی نوع بی در بین افراد بالغ خصوصاً آنهاییکه از خال کوبی استفاده میکنند و یا تاریخچه زردی داشته اند بلندتر تثبیت شده است. لازم است که یک مطالعه ملی بخاطر میزان و بار مرض متذکره در سطح کشور راه اندازی شود تا روش های خوب وقایوی و پیش گیری روی دست گرفته شده بتواند.

Introduction

Infection due to hepatitis B virus (HBV) and hepatitis C virus (HCV) are important public health problems globally. The virus causes acute or chronic infections and liver cell damage that give rise to a costly management, complications and case fatality (Kramer A, Kretzschmar M & Krickeberg K, 2010). Chronic infections with HBV and HCV are known risk factors for cirrhosis and liver cancer. Globally 57% of cirrhosis is attributable to either HBV (30%) or HCV (27%) and 78% of Hepatocellular carcinoma (HCC) is 53% attributable to HBV 25% to HCV (Joseph FP, Gregory LA, Leigh AF, Yvan JFH, Beth PB, 2006).Worldwide it is estimated that about 2 billion persons have serologic evidence of HBV infection while over 350 million people are carriers of chronic HBV worldwide (Singhal V, Bora D, Singh S, 2009). Approximately 170 million people have chronic HCV infection and 3-4 million people are newly infected annually (Mukhopadhya A, 2008). A systematic review found that globally the prevalence and number of people with anti-HCV has increased from 2.3% to 2.8% and >122 million to >185 million between 1990 and 2005 (Hanafiah KM, Groeger J, Flaxman AD, Wiersma ST, 2013). In the Middle East region, the prevalence of HBV carriers among adults varies from less than 2%, as in Bahrain, to more than 15%, as in the Republic of Yemen (Qirbi N, Hall A, 2001).In a study which was conducted in Lahore Pakistan among tested samples 4.9% of the subjects were confirmed to harbor active HCV infections in adult population without gender difference (Anwar MI, Rahman M, Hassan M, Iqbal M, 2013). In a hospital based study in Pakistan it was reported that hepatitis B and C was present in 5.15% of which 3.12% were suffering from hepatitis C and 2.02% were suffering from hepatitis B. In 0.12% patients both hepatitis

B and C infections were present (Khan MS, Jamil M, Jan S, Zardad S, Sultan S, Sahibzada AS, 2007). According to different studies the higher age, sex, absence of vaccination, history of jaundice, family history of liver disease, dental procedures, sexual contact, perinatal infection, blood and its derivatives, hemodialysis, intravenous and percutaneous drug use, occupational, habitual, and social behavior have been identified as risk factors for hepatitis transmission (ZaherNazzal Z, Sobuh I, 2014). Endemicity of HBV is classified as high (8% or more), intermediate (2-7%) and low (less than 2%) (Rao M B, 2012). According to this pattern of HBV in the neighboring and regional countries to Afghanistan (India, Iran and Pakistan) is in the intermediate level (Naz S, Ahmad M &Asghar H, 2011). The prevalence of HCV in south Asia including Afghanistan is estimated to be 3.4% (Hanafiah KM, Groeger J, Flaxman AD, Wiersma ST, 2013). Viral hepatitis including B and C is present everywhere in Asia and is endemic in Afghanistan (Wallace MR et al, 2002). In eastern Mediterranean region risk of infection with HBV is high in five countries including Afghanistan, Pakistan, Yemen, Sudan and Somalia accounting for more than 55% of the total population of the region (Rein DB et al, 2012).However few population-based infection prevalence data are available on hepatitis profile in Afghanistan. A cross-sectional sample of adult injecting drug users in Kabul from 2005-2006 reported the overall prevalence rates of Hepatitis B and Hepatitis C were to be around 6.5% and 36.6%, respectively (Todd CS, et al, 2009). Based on 2005 blood donor screening data and community surveys, it is estimated that 7% (1.7 million persons) of the general population have chronic HBV infection (MoPH, 2005). A recent meta-analysis estimates the prevalence was 1.9% for HBV and 1.1% for HCV in all available Afghanistan population (Khan S, Attaullah S, 2011).

As per health facilities' records, a total of 18,081 and 18,438 cases of acute viral hepatitis (all types) were reported in 2010 and 2011 (HMIS, 2014). However according to the disease early warning system (DEWS) data 76% of all acute viral hepatitis cases (all types) were reported in the group over five years of age (DEWS, 2009-2011). The prevalence of diseases in high-risk population is growing and that is a concern for health authorities due to great risk for epidemics of hepatitis in future. The main high risk groups in the country are people with low socio-economic status, injecting drug users (IDUs), sexual workers, healthcare workers, unsafe health practitioners, mobile populations and prisoners (Khan S, Attaullah S, 2011). Prevalence of HBV in injecting drug users (IDUs) ranged from 5.8-6.5%, with an overall prevalence of 6.15% while the prevalence of HCV in same population was 36.4 % (Nasir A et al, 2011). The prevalence of hepatitis B surface antigen (HBsAg) and HCV in obstetric populations in Kabul hospitals were 1.53% and 0.3% respectively (Todd CS, et al, 2009). In addition, the prevalence of HCV and HBV in Female Sex Workers (FSWs) in three big cities in the country was 1.92%, and 6.54%, respectively (Todd CS et al, 2010). Blood donor testing which is a source of population-based prevalence data as a result of testing 1,25,832 blood donors during the years 1989-2005 reported that 1.76% were positive for HBsAg and 0.63% for HCV (Todd CS et al, 2008). Due to war and conflict hundreds of thousands of people are either internally or externally displaced, residing in camps and cities across Afghanistan and living as refugees in neighbouring countries including Iran and Pakistan (Afghanistan National Strategic Framework for HIV/AIDS, 2008). Higher prevalence of hepatitis viruses has been reported among internally displaced as well as refugee populations outside of Afghanistan (Quddus A, Luby SP, Jamal Z, Jafard

T, 2006). The prevalence rate of HBsAg was 60.8% among Afghan refugees in Dalaki, Iran (Pourkarim MR, Zandi K, Davani NA, Pourkarim HR, Amini-Bavil-Olyaee S, 2008) and 8.3% were found positive for HBsAg in Baluchistan, Pakistan and 4.1% and 5% in the United States between 1979-1991 and 2007-2008, respectively (Rein DB, Lesesne SB, O'Fallon A, Weinbaum CM, 2009). The Prevalence of HBV and HCV is not published yet among health workers. There heterogeneous distribution of HBV genotypes in Afghanistan. It is demonstrated that genotype D (35.67%) is the predominant genotype circulating in Afghani's population while genotype C was observed in 32.16% followed by genotype A (19.30%), and genotype B (7.02%) (Attaullah S, Rehman S, Khan S, Ali I, Ali S, Khan SN, 2011). Afghanistan is considered to be a country of low HIV prevalence but at high-risk for spread of HIV infection. It is estimated that the country suffer from less than 0.5% prevalence of disease.

Based on abovementioned discussion and due to years of war and conflict as well as competing priorities little information is available burden of HBV and HCV in Afghanistan. This study aims to estimate the seroprevalence of HBV, HCV and HIV infection among adult populations in Jalalabad city, Nangarhar Province Afghanistan.

Method

Study design and setting: A cross sectional study modifying WHO STEP wise approach was used to collect data on prevalence of risk factor for non-communicable diseases as well as identifying prevalence of Hepatitis B, C and HIV infection with associated risk factors in adult population of Jalalabad city. The city is located in eastern part of Afghanistan with sharing border with Pakistan. The field part of the study was carried out during May-June 2013. All permanent households of 25-65 years of age, including men and women who were residents in mentioned city during the study period, and gave consent to participate, were included in the study. Temporary residents (less than six months) in provinces and those living in institutionalized settings along with insecure areas were excluded from the survey.

Sampling strategy and techniques: Taking into account the highest prevalence, 95% confidence interval and band of error of 5% the sample size was calculated as 385 subjects. Taking into consideration the proportion of risk factors in diseased and non-diseased people in similar settings, the number of subjects in this study raised to 600 individuals. To balance considerations of non-response rate, cost, resources, and time without compromising the representativeness of the sample, a two-phase cluster sampling technique were used. Lastly, taking into account the design effect (DE=2) of cluster sampling the final sample size reached to (2X600) = 1200 which was reasonable for achieving study objectives. We used cluster approach of expanded program on immunization (EPI) in which the city is divided into four clusters (A – D) and 20 sub-clusters. So that our primary sampling unit (PSU) was sub-clusters, the secondary sampling units (SSU) were streets/areas, tertiary sampling unites (TSU) was households and ultimate sampling units (USU) was respondent more than 25 years in the household. The interviewer was instructed to find a fixed landmark in a very populated street within the boundaries of the selected location and following the bottle rotating rule proceed to series of households. The households with only one person meeting the eligibility criteria were the designated respondent. For households' more than one person random method of lottery used to choose the subject.

Data collection: The standard questionnaire which is designed by WHO for collection of data for risk factor of non-communicable diseases was revised

and variables thought to determine the pattern of hepatitis B and C included. In direct face to face interview demographic and behavioral data collected. In addition blood samples collected to identify and shipped to central public health laboratory for serological testing.

Laboratory serological testing: Blood specimens were collected by a trained data collector using local SOP developed for this purpose. After centrifuging the samples in local provincial lab by a qualified lab technician, they were packaged and send to central public health laboratories in Kabul where it was stored for serological tests. Viral serology included HBsAg and hepatitis C antibodies (HCV-Ab) and HIV rapid tests provided by National HIV control Program. Initially rapid tests was run for all samples with specificity and sensitivity of 99% (Standard diagnostic, China) and later on confirmatory test conducted for Hepatitis B using ELISA (Biored Company, France). The tests were anonymous and coded by the researcher.

Ethical Consideration: Protocol of the study was submitted to Institutional Review Board (IRB) in the ministry of public health and approval was taken. All administrative issues were considered in the field. Written informed consent was taken from the study subjects after simple explanation about the purpose of the study and the benefit they would get and that personal and medical data would be confidential and used for scientific research only. Furthermore, the serological results were provided to the subjects on completion of the tests and any infected subjects were provided with appropriate information on the prevention of further spread of these infections and were referred to the regional hospital in Jalalabad province.

Statistical Analysis: Statistical software package SPSS, version 20 used to run statistical analysis. For descriptive statistics the mean and standard deviation (SD) were used for quantitative variables. The number and percentage were used for qualitative variables. For analytic statistics the chi-squared test was used to assess the differences in frequency of qualitative variables, while Fisher exact test was applied if any expected cell values in a 2 × 2 table was < 5. Logistic regression analysis was done to predict and rank the relationship between different studied variables. Significance levels of $P < 0.05$ were assumed to verify the statistical methods.

Results

Description of socio-demographic characteristics: A total of 1200 subjects (60.9% females 39.1% males) with a mean age of 38.78 (SD 11.05) years (range 25–70 years) were enrolled in the study. There a total number of 1199 (one poor sample discarded) subjects for whom the lab tests results were available. With respect to laboratory results of infection with viral hepatitis, only 45 participants (3.8%) were seropositive for HBsAg on rapid test and 41 (3.4%) were confirmed positive after ELIZA test. Totally 11 subject (0.9%) were seropositive for anti-HCV on rapid tests. Both infections coexisted in none of participants. In addition after full testing of all samples none of them were positive for HIV infection.

Approximately two-third of participants (71.2%) were illiterate including those who were not enrolled in the education system and could not read and write. More than half of participants (53.4%) were housewives doing indoor affairs. Minority (9.2%) of study subjects worked as official employees of government or non-governmental organizations. Being a sensitive issue participants were reluctant to give answer regarding the monthly income of family although it was given as a range, however 59% out of all participants had income of less than 10000 Afghani (1$=57Afghani). A sum-

mary of the important demographic data including age groups, sex, education level, work status, income, marital status and knowledge of hepatitis are shown on Table1.

Description of behavioral characteristics: All information regarding risk factor of hepatitis was asked in last six month. After descriptive analysis of risky behaviors of the study it was found that 18.8% of study sample were exposed to blood transfusion. In addition, 29.2% and 66.4% have experienced surgical and dental procedures. More than two-third of subjects (77.7%) had been exposed to needle injection, 18.1% had history of jaundice, 61.2% had received piercing of nose and ear, 29.2 % had practiced tattooing, 44.3% had visited hospitals, 11.3% had been vaccinated by their expression and 11.2% had lived with infected chronic patients. A minority of them (< 1%) had been exposed to street barbers while 32.9% and 5% exposed to simple and modern barber shops. Smoking and mouth snuffing was 6.2% and 10.7% prevalent among study participants. For full information you can visit table 2.

Statistical Analysis of risk factors: As we did analysis to see the relationship of HBV infection and socioeconomic factors, no statistical significant differences were found between negative and positive cases regarding mentioned factors of the study sample, except for sex. Those who were female were 0.35 times (95% CI:0.18 - 0.68) less likely to be exposed to HBV as compare to male (table 3). Regarding risk factors and risky behaviors of those with HBV infection, we found statistically significant differences between those negative and positive for HBV infection with regard to history of jaundice, living under one roof with hepatitis cases and tattooing (table 4). However due to less number of HCV cases (11) we did not found any significant association of both sociodemographic and risky behaviors and HCV. Finally risk factors already found significant in the bivariate analysis were reanalyzed by a multivariate analysis. The risk of HBV infection was statistically significant for sex, history of jaundice and tattooing with HBV (table 5).

Discussion

Viral hepatitis particularly infection with HBV and HCV are global public health problems affecting millions of people every year mostly in developing countries. Afghanistan is a war stricken country which is suffering double burden of diseases. Communicable diseases account for 60 to 80 percent of all curative outpatient visits and more than half of all deaths (Disease Early Warning System (DEWS) Fact sheet, 2011) while non-communicable diseases (NCD) are responsible for about 34% of total deaths in the country (AMS, 2010). Although ministry of public health in Afghanistan mentions in its policy document (MoPH, 2012) to ensure detection and control of Hepatitis B, C, and other common types of viral hepatitis in the country and generate evidence and data on the magnitude and spread of hepatitis, however there is no data available to nationally reflect the burden of viral hepatitis in the country. This study tried to estimate the seroprevalence and risk factors for HBV and HCV in Jalalabad city, located in the eastern region of the country. In this study the total prevalence of HBsAg positive cases was 3.8% by initial rapid test while 3.4 % confirmed later and prevalence of HCV was 0.9%. These findings are compatible with other studies which have been conducted earlier (Rein DB et al, 2012 and Todd CS, et al, 2009). Moreover, according to this pattern of HBV the country is in intermediate level like its neighboring countries (Ali M, Idrees M, Ali L, Hussain, A, Rehman A, Saleem S, Afzal S & Butt S, 2011). However the prevalence of HCV (0.9%) is much lower as compare to prevalence

of HCV (AMS, 2010) estimated by World Health Organization (WHO) worldwide (WHO, 1999) and (3.4%) which is estimated in south Asia (Hanafiah KM, Groeger J, Flaxman AD, Wiersma ST, 2013). The prevalence of HBV recorded in our study was comparable with rates reported in regional countries such as Egypt (4.7%) (Youssef A et al, 2009), Iran(3%) (Farzadegan H, Shamszad M, Noori-Arya K, 1980) and Pakistan (2.4%)(Khokhar N, Gill ML, Malik GJ, 2004). No positivity of blood samples for HIV infection shows that the prevalence of diseases is low in the country however due to high level of risk factors for HIV/AIDS the country is at higher risk if proper prevention interventions are not implemented.

The statistically significant risk factors for HBV infections detected in our study were previous being male, having history of jaundice and exposure to tattooing. Sex (male) as a non-modifying factor had association with HBV and this could be due to more exposure of male stratum to risky practices out of home as compare to female who are mostly housewives in this study. This finding is also supported by other studies (Janahi EM, 2014). In addition, tattooing has been found a risky behavior in other study as well (Ghadir, MR et al, 2012). History of jaundice means that the subject has possibly been exposed to viral hepatitis which is supported by a Chinese study (Zhang H et al, 2011).

The pattern of Hepatitis B and C in Jalalabad city is comparable to other studies conducted in other areas of Afghanistan as well similar settings out of the country. The intermediate prevalence rate of hepatitis B in Jalalabad city is a trigger point for planning and conduction of more studies to estimate the national burden of hepatitis in the country. Focusing on education and awareness for male population will have more impact on reduction the burden of infection in this city. Traditional tattooing is one of the means for transmission of hepatitis B and community based health care should take suitable action in this regard.

Table 1: Socieo-demographic characteristics of study participants in Jalalabad City			
Characteristics	**Groups**	**Number**	**%**
Age in years			
	25 - 34	445	37.9
	35 - 44	311	25.9
	45 - 54	209	17.4
	54 and over	128	10.7
	Missing	97	8.1
Sex			
	Female	731	60.9
	Male	469	39.1
Level of education			
	Illiterate	853	71.2
	Primary/Unofficial Education	141	11.9
	Secondary School	139	11.7
	University and more	53	4.4
	Missing	14	1.2
Work Status			
	Official Employee	110	9.2
	Business	74	6.2
	Farmer/worker	224	18.7
	Housewife	651	53.4
	Unable to work/retired	81	6.8
	Missing	60	5
Monthly income (Afghanis)			
	≤ 10000	708	59
	10000 - 20000	42	3.5
	≥ 20000	43	3.6
	Missing	407	33.9
Marital Status			
	Single	90	7.5
	Married	1051	87.6
	Widows/widower	45	3.9
	Missing	13	1.1
Knowledge of Hepatitis			
	No	213	17.8
	Yes	970	80.8
	Missing	17	1.4

Table 2: Behavioral characteristics of study participants in Jalalabad city			
Characteristics	**Groups**	**Number**	**%**
Blood Transfusion			
	No	948	79
	Yes	226	18.8
	Missing	26	2.2
Surgery Procedure			
	No	826	68.8
	Yes	350	29.2
	Missing	24	2
Dental Procedure			
	No	375	31.3
	Yes	797	66.4
	Missing	28	2.3
History of Jaundice			
	No	949	79.1
	Yes	217	18.1
	Missing	34	2.8
Needle Injection			
	No	235	19.6
	Yes	932	77.7
	Missing	33	2.8
Piercing			
	No	376	31.3
	Yes	734	61.2
	Missing	90	7.5
Tattooing			
	No	754	62.8
	Yes	350	29.2
	Missing	96	8
Hospital visit			
	No	648	54
	Yes	531	44.3
	Missing	21	1.8
Living with Hepatitis Patients			
	No	1028	85.7
	Yes	134	11.2
	Missing	38	3.2
Vaccination Status			
	No	1033	86.1

	Yes	132	11.3
	Missing	35	2.9
Type of barber used			
	Street Side	10	0.8
	Simple Shop	395	32.9
	Modern Shop	60	5
	Missing	735	61.3

Table 3: Hepatitis B virus infection status and its relationship to socieodemographic factors in study

Characteristics	Groups	HBV Positive	HBV Negative	Odds Ratio	CI 95%
Age in years					
	25 - 34	16 (3.5)	439 (96.5)	1	Reference
	35 - 44	9 (2.9)	302 (97.1)	0.81	0.35 - 1.87
	45 - 54	9 (4.3)	200 (95.7)	1.23	0.53 - 2.84
	54 and over	3 (2.4)	124 (97.6)	0.66	0.19 - 2.31
Sex					
	Female	15 (2.1)	716 (97.9)	0.35	0.18 - 0.68
	Male	26 (5.6)	442 (94.4)	1	Reference
Level of education					
	Illiterate	25 (2.9)	827 (97.1)	1	Reference
	Literate	15 (5.4)	265 (94.6)	0.53	0.27 - 1.02
Work Status					
	Official Employee	3 (2.7)	107 (97.3)	1	Reference
	Business	6 (8.10)	68 (91.9)	3.14	0.76 - 13
	Farmer/worker	15 (6.7)	209 (93.3)	2.56	0.72 - 03
	Housewife	14 (2.2)	637 (97.8)	0.78	0.22 - 2.77
	Unable to	2 (1.5)	78 (97.5)	0.91	0.14 - 5.60
Monthly income					
	≤ 10000	27 (3.8)	680 (96.2)	1	Reference
	10000 - 20000	4 (9.5)	38 (90.5)	2.65	0.88 - 7.96
	≥ 20000	1 (2.3)	42 (97.7)	0.6	0.08 - 4.52
Marital Status					
	Married	37 (3.5)	1013 (96.5)	2.44	0.58 - 10.26
	Unmarried	2 (1.5)	134 (98.5)	1	Reference
Knowledge of					
	No	7 (3.3)	206 (96.7)	1	Reference
	Yes	33 (3.4)	936 (96.6)	0.96	0.42 - 2.20

Table 4: Hepatitis B virus infection status and its relationship to socie-odemographic behavioral risk					
Characteristics	**Groups**	**HBV Positive**	**HBV Negative**	Odds Ratio	CI 95%
Blood Transfusion					
	No	35 (3.7)	913 (96.3)	1.68	0.65 - 4.35
	Yes	5 (2.2)	220 (97.8)	1	Reference
Surgery Procedure					
	No	29 (3.5)	797 (96.5)	1.02	0.51 - 2.02
	Yes	12 (3.4)	337 (96.6)	1	Reference
Dental Procedure					
	No	17 (4.5)	358 (95.4)	1.52	0.81 - 2.87
	Yes	24 (3)	772 (97)	1	Reference
History of Jaundice					
	No	24 (2.5)	924 (97.5)	0.3	0.16 - 0.57
	Yes	17 (7.8)	200 (92.2)	1	Reference
Needle Injection					
	No	12 (5.10)	223 (94.4)	1.67	0.81 - 3.33
	Yes	29 (3.10)	902 (96.9)	1	Reference
Piercing					
	No	19 (5.1)	356 (94.9)	2	1.05 - 3.84
	Yes	19 (2.6)	715 (97.4)	1	Reference
Tattooing					
	No	35 (4.6)	718 (95.4)	4.21	1.48 - 11.95
	Yes	4 (1.10)	346 (98.9)	1	Reference
Hospital visit					
	No	21 (3.2)	627 (96.8)	0.95	0.50 - 1.80
	Yes	18 (3.4)	512 (96.6)	1	Reference
Living with Hepatitis Patients					
	No	32 (4.4)	691 (95.6)	2.94	1.28 - 6.68
	Yes	7 (1.60)	442 (98.40)	1	Reference
Vaccination Status					
	No	34 (3.3)	998 (96.7)	1.09	0.38 - 3.12
	Yes	4 (3)	128 (97)	1	Reference

Table 5: Multivariate analysis of Hepatitis B virus infection and its relationship to socieodemographic				
Variables	**B**	**Exp (B)**	**95%CI**	**Pvalue**
Sex	-1.04	0.35	0.16 - 0.74	0.007
Tattooing	1.3	3.7	1.05 - 13.02	0.041
History of Jaundice	-1.39	0.24	0.12 - 0.49	0.000
Marital Status	1.69	5.47	0.73 - 40.88	0.098
Dental Procedure	0.62	1.87	0.92 - 3.8	0.082

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Early Warning System for Priority Infectious Diseases in Afghanistan: Analysis of Nine Years Data, 2007-2015

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Abstract

Background: Indicator based surveillance (IBS) and event based surveillance (EBS) are carried out by Disease Early Warning System (DEWS) which is consisting of 506 sentinel sites across the country by Ministry of Public Health. This paper describes the pattern of morbidity and mortality due to priority diseases and explain burden of outbreaks reported through the Disease Early Warning System (DEWS) in Afghanistan. .

Method: Using a descriptive design, we analyzed nine year data (2007-2015) including routine weekly reports and outbreaks. The data have been collected weekly and occasionally by outbreaks via surveillance system on priority diseases including Acute respiratory infections (ARI,) diarrheal diseases, vaccine preventable diseases and so on. Main priority diseases have been analyzed and using MS access, excel and GIS tables; graphs and maps have been created and reported.

Results: During nine years (2007-2015) the system has collected 117,280 weekly reports and investigated 2,336 outbreaks. Analysis of nine years data shows that the proportion of ARI out of total clients increased during winter season up to 35% and it decreased to 10% during summer season. At the same time the proportion of diarrheal diseases (DD) out of total clients increased up to 18% in summer season while it decreased to less than 5% in winter season. The fluctuation of malaria from 2.5 % to 1% and typhoid fever from 1.4 to 0.6% has been declined since 2007. The three top killers are pneumonia, meningitis, and diarrheal diseases and case fatality rates are identified higher for meningitis (6.7%), tetanus (14.5 %), hemorrhagic fevers (16-30%), and others. Main outbreaks of Measles, Crimean-Congo hemorrhagic fever, Mumps, Scabies, Influenza H1N1, Brucellosis, Q-fever and food poisoning are reported.

Conclusion: The system was able to detect, investigate and responded to major outbreaks of infectious and vaccine preventable diseases in the country. Consequently, main morbidity and mortality have been averted by implementation of DEWS/Surveillance system during the last nine years. It has been contributed in national decision making and supported the implementation of international health regulation (IHR) in the country. Improving coordination, enhancing culture of evidenced based decision making, integrating surveillance of health problems is recommended.

Keywords: Surveillance, DEWS, Sentinel Site, Outbreaks, Trend, Morbidity, Mortality

سیستم هشدار دهی فوری برای امراض انتانی دارای اولویت در افغانستان: تحلیل ارقام نه ساله (2007 الی 2015)

چکیده

پس منظر: سیستم مراقبت متکی به شاخص و سیستم مراقبت متکی به وقایع از طرف سیستم هوشدار دهی فوری برای امراض از طریق 506 مرکز مراقبتی در سراسر کشور در چوکات وزارت صحت عامه به پیش برده میشود. این رساله روند مرگ و میر و شیوع امراض از باعث مشکلات مرضی دارای اولویت برای وزارت صحت عامه و بار طغیان های امراض را تشریح مینماید. این راپور وقایع گزارش داده شده برای سیستم هوشدار دهی فوری به امراض را تحلیل و بررسی مینماید.

مواد و روش کاری: با استفاده از یک طرح تشریحی ارقام نه ساله (2007 الی 2015) به شمول گزارشات هفته وار و راپور های طغیان های امراض مورد تحلیل و بررسی قرار گرفته است. آمار متذکره توسط سیستم مراقبت صحی بصورت هفته وار جمع آوری شده و در ضمن گزارشات طغیان های امراض گزارش شده مورد تحلیل قرار گرفته است. امراض دارای اولویت متذکره عبارت اند از انتانات حاد طرق تنفسی (ARI)، امراض اسهالی، امراض قابل وقایه توسط واکسین و غیره میباشند. نرم افزار هایAccess،Excel و GIS بخاطر تهیه جدول ها،گراف ها و نقشه ها مورد استفاده قرار گرفته است.

نتایج: در جریان نه سال از 2007 الی 2015 سیستم هوشدار دهی فوری از امراض 117280 گزارش هفته وار را جمع آوری نموده و 2336 شیوع طغیان امراض را کشف،تحقیق و مدیریت نموده است. تحلیل ارقام نه ساله نشان میدهد که میزان امراض حاد طرق تنفسی نزد تمام مراجعین بخش صحت در جریان فصل زمستان به 35 فیصد رسیده در حالیکه این رقم در جریان تابستان به 10 فیصد کاهش یافته است. در عین زمان میزان امراض اسهالی نزد تمام مراجعین مراکز صحی در جریان فصل تابستان به 18 فیصد رسیده در حالیکه در فصل زمستان به 5 فیصد کاهش یافته است. تموج میزان ملاریا و تب محرقه از سال 2007 الی اکنون از 2.5 و 1.4 فیصد به 1 فیصد و 0.6 فیصد کاهش یافته است. مهم ترین علت مرگ و میر عبارت از سینه و بغل، التهاب سحایا و امراض اسهالی بوده است. میزان کشندگی مشخص برای التهاب سهایا و تیتانوس و تب خوندهنده بالترتیب عبارت از 6.7، 14.5 و 16-30 فیصد بوده است. مهم ترین طغیان های امراض عبارت از سرخکان، تب خوندهنده کانگو و کریمیان، کله چرک، سکبیس، انفلوانزا، بروسیلوز و مرض کیو و تسممات غذایی بوده است.

نتیجه گیری: سیستم مراقبت موجود توانایی کشف و تحقیق و ارایه پاسخ به طغیان های بزرگ امراض انتانی و امراض قابل وقایه به واکسین را داشته است. روی این دلیل امراض انتانی و مرگ و میر ناشی از این امراضبا تطبیق برنامه هوشدار دهی فوری از امراض در نه سال اخیر جلوگیری گردیده است. این نظام در تصمیم گیری های ملی نقش داشته و در تطبیق مقرره صحی بین المللی در کشور رول بازی کرده است. بهبود هماهنگی و ترویج کلتور استفاده از ارقام و ادغام سیستم مراقبت های متنوع به یک سیستم واحد پیشنهاد میگردد.

کلمات کلیدی: سیستم مراقبت یا سرویلانس، سیستم هوشداردهی فوری از امراض، مراکز مراقبتی، طغیان امراض، تمایل ارقام، مصابیت ها، مرگ ومیر

Introduction

Afghanistan is a low-income country that has experienced conflicts, post-conflicts, and recommence of conflicts unremittingly (MOPH, 2010). Years of war and conflict have damaged the economic and social infrastructure including health system (Sharp TW, Burkle FM, Vaughn AF, Chotani R, Brennan RJ, 2002). The recent achievements after rebuilding of health system are remarkable in the country. However hundred thousands of people are internally and externally displaced due to conflicts and natural disaster (MOPH, 2010).

Before 2007, there was fragmented public surveillance system which was mostly program, disease and donor based and the activity was improperly managed by MoPH. The situation started changing when the Afghanistan's Ministry of Public Health (MOPH) in collaboration with donors, the international and national NGOs developed and implemented Basic Package of Health Services (BPHS) and Essential Package of Hospital Services (EPHS) in the country. Disease Early Warning System (DEWS) was linked with the BPHS and EPHS; the sole primary and secondary care system operating in the country. To fully grasp the definition of DEWS it is useful to start by defining the terms 'disease,' 'early,' 'warning,' 'system. DEWS represent the set of capacities needed to generate and disseminate timely and meaningful warning information that enables at-risk individuals, communities and organizations to prepare and act appropriately and in sufficient time to reduce harm or loss (adapted from UNISDR 2009 and others). Disease means an illness or medical condition, irrespective of origin

or source that presents or could present significant harm to humans. Early signifies prior to the arrival of a hazard or threat — while there is still time to reduce potential harm or loss, or prevent a disaster. A warning is the message (using signs, words, sounds or images) that announces an imminent danger. A system is an ordered and standardized compilation of elements that remaining constant fluctuation with movement in multiple directions (community early warning systems, 2012).

Syndrome surveillance is simple and often the only available surveillance tool at primary health care level, when laboratory confirmation of disease is not possible. It allows detection of potential outbreaks of targeted diseases earlier than with the diagnosis-based routine surveillance system and leads to field investigations for confirmation and control (Weekly epidemiological record, 2004). The early warning theory has originated from military affairs, and extended to economy, earth quake, flood, biological disaster and so on (Gleason, et al., 1995)

A warning system must empower individuals, communities and businesses to respond timely and appropriately to hazards in order to reduce the risk of death, injury, property loss and damage. Warnings must get the message across and stimulate those at risk to take action (Gunasekera, 2004). Early warning (EW) is "the provision of timely and effective information, through identified institutions, that allows individuals exposed to hazard to take action to avoid or reduce their risk and prepare for effective response." It is the integration of four main elements of risk knowledge, monitoring and predicting, disseminating information and response (United Nations report, 2006). Early warning of outbreaks and the capacity for prediction of spread to new areas is an essential pre-requisite for the effective containment and control of epidemics. Early Warning and Response is based on the concept that dealing with a disease epidemic in its early stages is easier and more economical than having to deal with it once it is widespread. From a public health perspective, early warning of outbreaks with a known epidemic potential will enable control measures that can prevent human morbidity and mortality. Several initiatives, at national and regional levels have already been developed in the field of early warning. At the international level FAO, OIE and WHO have each developed Early Warning and Response Systems that systematically collect, verify, analyze and respond to information from a variety of sources, including unofficial media reports and informal networks (GLEWS, 2006). Early Warning and Response System (EWARS) has been established in order to complement the Health Management Information System (HMIS). The HMIS report is submitted on a monthly basis, and thus is not conducive for use as an early warning system. In contrast, EWARS provided a systematic collection, collation, analysis, interpretation, and dissemination of data on identified diseases for immediate public health action, monitoring, and timely response to outbreaks of these priority diseases (David F, Lalit M. Nath B, Sharma A, Koirala S, 2004).In latest Ebola Virus Disease (EVD) outbreak which brought unpredicted morbidity and mortality to west Africa. Establishment of national and regional inter-sectorial and trans-disciplinary surveillance response systems that include early warnings, as well as critical human resources development is recommended to be quickly adopted by allied ministries and organizations in African countries in epidemic and pandemic responses (Tambo et al, 2014). Anyway, there is no doubt in importance of such a system in conflict affected countries; however utilization of data generated by the system is of paramount important as well. Under umbrella of Surveillance Directorate in Af-

ghanistan National Public Health Institute (ANPHI), Disease Early Warning System (DEWS) was first established in December 2006, with technical support of World Health Organization (WHO) and financial support of the United States Agency for International Development (USAID). It was mainly involved in routine weekly reporting of priority diseases and outbreak investigation & response. General directorate of ANPHI is the National Focal Point (NFP) for implementing International Health Regulations (IHR-2005). Surveillance Directorate is therefore the critical department of ANPHI under which DEWS operates. This study aims to analyze the nine years data (2007-2015) collected via surveillance/Disease Early Warning System department at Evaluation and Health Information System (EHIS) and reflect the burden of main health problems prioritized by Ministry of Public Health (MoPH). It would help policy makers and program managers to plan, implement and evaluate their projects accordingly.

Method

The database for Disease Early Warning System (DEWS) under ANPHI in MoPH was reviewed and analyzed in order to describe the burden of common prioritized infectious diseases in last nine years from 2007 to 2015.In addition, the annual reports, outbreaks reports and reports of daily injury surveillance were included in analysis.

Since 2007, DEWS as a sentinel site based surveillance system has been operating in public health facilities. Initially, it was established with eight sentinel sites in eight regions and slowly and gradually expanded to all 34 provinces. As of end of 2013, there were 368 sentinel sites operating mainly in regional, provincial and district hospitals as well as comprehensive and basic health centers. Gradual expansion of the DEWS sentinel sites by year starting with 123 sentinel sites initially in 2007 and expanded to 506 by end of December 2015. The selection of these sites are based on the geographic location, burden of communicable diseases in the area, history of past outbreaks, availability of communication systems (internet/mobile phones) and population density. However, the final selection is done after obtaining the approval of Provincial Public Health Coordination Committee (PPHCC) in the provinces. Though DEWS carries out incidence based surveillance (IBS) for 15 communicable diseases reported weekly from these sentinel sites outbreaks and unusual events are informed through event based surveillance (EBS) immediately from the community through Provincial Council, Provincial Public Health Directors (PPHDs), governors, parliamentarians and media. The function of this surveillance system (DEWS) is to detect not only known targeted diseases with established case definitions but also diseases, events or hazards that are not specifically included in the formal reporting system.

All levels of Disease Early Warning System, from sentinel-sites to national directorate of surveillance, are involved in surveillance activities to detect and respond to the recommended priority diseases or events. After identification of cases with priority diseases and events using standard case definitions at health facility level and early detection of the outbreaks at community level, it is reported on a weekly basis and shared at earliest to the next administrative level. Data are compiled, analyzed and interpreted at multiple levels (sentinel-site, provincial, regional and national). Suspected outbreaks are investigated and immediate response is provided within 48 hours. Finally findings regarding morbidity and mortality of priority diseases are disseminated to wide stakeholders. Simultaneously the appropriate preventive control measures are implemented in coordination with stakeholders at all levels. Weekly reports

collected by DEWS are stored in an access based database which was used for analysis to fulfill the objective of this study.

Results

Currently, disease surveillance system has 506 sentinel sites in all 34 provinces of Afghanistan . Figure 2: Distribution DEWS sentinel sites by types and locations, December 2015

Routine Surveillance Data (Indicator Based Surveillance or IBS)

During the nine years, the system has collected 117,280 weekly reports on 15 priority diseases (syndromes) such as acute respiratory infections (ARI) including pneumonia and common cold, diarrheal diseases including acute watery diarrhea, acute bloody diarrhea and acute watery diarrhea with dehydration, suspected meningitis, suspected acute viral hepatitis, vaccine preventable diseases such as suspected measles, pertussis, diphtheria, tetanus/neonatal tetanus and finally suspected malaria, typhoid fever and hemorrhagic fevers. Various types of health facilities act as sentinel sites and reports routine data on weekly basis as well as detect and investigate outbreaks. Generally 14 % are basic health centers (BHC), 57% are comprehensive health centers (CHC), 16% are district hospitals (DH) and the rest are in 32 provincial and regional, and in 14 national and special hospitals. The distribution of sentinel sites and their types are shown in figure 2.

Cyclical trend analysis of priority health problems

Analysis of nine years data shows that the proportion of ARI out of total clients increased during winter season up to 35% and it decreased to 10% during summer season. At the same time the proportion of diarrheal diseases (DD) out of total clients increased up to 18% in summer season while it decreased to less than 5% in winter season. This is quite as cyclical seasonal trend of ARI and DD which is depicted in figures 3-6.

Furthermore, it seems that the fluctuation of malaria and typhoid fever has decreased annually and the proportion of cases as percentage of total clients for malaria in highest peak was 2.5% in 2007 while it has decreased to less than one percent after nine years at its highest peak. Additionally, the proportion of typhoid fever as percentage of total clients has decreased from 1.4% in 2007 to 0.5% in 2015.

Geographical pattern of priority health problems

During 2015, the proportion of ARI cases as % of total clients was reported the highest in Sari-e-pule followed by Balkh and Jawzjan provinces. Similarly, Farah, Khost and Nursitan were the three top provinces with highest proportion of diarrhea diseases. In figures 8-10 the top ten provinces and districts are depicted for burden of ARI, DD, Malaria and Measles based on data for 2015.

In order to compare the burden of ARI as pneumonia, DD, measles and malaria, we used the data for 2015 and developed choropleth maps. According to maps the eastern and northern region are suffering more from pneumonia as compared to other parts of the country while burden of DD are more in south and west of the country along with east and northern regions. Burden of measles is evident in north, south and eastern region and burden of malaria all over the country except the central parts as a threat which continues from east to west borders. Figures 12-15 depicts density maps for mentioned diseases for 2015.

Trend of measles is very much seasonal specific; however it seems that there is high proportion of burden of measles during spring and fall seasons as compared to other seasons with high burden in under-five age group as compare to age group of five years and over. Proportion of typhoid fever

by age group in public health facilities is higher in age group of under-five as compared to more than five years. In addition, the trend shows higher burden during summer season as compared to other season.

Mortality analysis

Record of mortality data in sentinel sites shows that the majority of deaths are due to few priority health problems such as pneumonia, suspected meningitis or severely ill child, acute watery diarrhea with dehydration, suspected acute viral hepatitis, suspected malaria and measles. For easy review the table1shows the percentage of mortality due to DEWS priority diseases in last nine years.

Outbreaks detection and Investigations (Event Based Surveillance or EBS)

Basically the outbreaks of infectious diseases such as Measles, Cholera, acute gastroenteritis, ARIs, Pertussis, Chicken pox, Hepatitis, Typhoid fever and Malaria are more frequent in Afghanistan. Totally in nine years 2,336 outbreaks of Meningitis, Crimean-Congo hemorrhagic fever, Mumps, Scabies, Pandemic Influenza H1N1, Brucellosis, Q-fever and Food poisoning are reported less frequently. Based on analysis data via surveillance, the system have investigated the alerts reported by focal points in sentinel sites, other public and private health facilities, community and local government officials. Besides other investigation steps, if necessary, samples are collected from the suspected cases and sent to Central Public Health Laboratory (CPHL) for laboratory confirmation. The final outbreak report is prepared by investigation and response team and shared with central DEWS department through regional DEWS coordinators. The available outbreak data are restricted to the outbreaks reported to DEWS.

The number of total outbreaks detected, investigated and responded by DEWS since 2007 to 2015 is more than 2,336 with various number of cases. Figure 24 shows the number of outbreaks detected, verified, investigated and controlled by year from 2007 to 2014. Main outbreaks detected and investigated were Crimean and Congo Hemorrhagic Fever (CCHF), Measles, Cholera and Pertussis. Figure 25 shows comparison of these major outbreaks by year from 2007 to 2015.

3. Pandemic Influenza Preparedness The system was also able to respond well the pandemic influenza during 2009 and controlled the influenza pandemic properly. The influenza system currently able to detect, investigate and respond to any influenza threat by support of Pandemic Influenza Preparedness (PIP) initiative funded by WHO . The PIP enables the system to upload regularly the current routine virologic and epidemiological weekly data of Afghanistan on FluID and FluNet website(available at http://www.who.int/influenza/surveillance_monitoring/fluid/en/) . Finally, the system is now able to share its influenza virus isolates with WHO collaborating center for further virologic analysis and influenza vaccine preparation.

Discussion

Generally, there are two aspects which is needed to be taken into account about this paper; one that how crucial the DEWS is for data collection on priority diseases that alerts policy makers and program managers to plan a response in time for controlling the diseases; while the other aspect is findings from the data collected through the system which was used for action at various levels. Availability of Disease Early Warning System as a sentinel based public health surveillance has both component of indicator based as well as event based surveillance, is a strong point for the country and its health system like Afghanistan. DEWS generates evidence for policy and planning

in terms of prevention and control of communicable diseases and conditions under surveillance. The trends it provides could be used for taking strategic decision by policy makers. For effective and early detection of disease outbreaks early warning component of DEWS has been a privilege and it has been strengthened to detect outbreak alerts and respond to that. It is evident that incidence rate is ideally used for comparing disease frequency in different locations, at different times, or among different groups of persons with potentially different sized populations. But the true estimates of the incidence require further information than can be supplied by the sentinel surveillance system. To adjust for denominators, DEWS surveillance system considers total consultations as denominator for calculations of rates and percentages. Therefore, the system could contribute or completed some other ways of data collection such as surveys and studies. It is important to remember that this sentinel surveillance results are representative and generalizable for the population who have access to public health facilities while private sector and community representation will be enhanced in coming years through inclusion into surveillance system.

Despite the ongoing situation of war and conflict, the DEWS have achieved a gradual increase in number of sentinel sites and outbreak investigations. The system has been able to track the seasonality of diarrheal and Acute Respiratory Infections. It has averted the mortalities and morbidities could have been occurred as a result of outbreaks. The system has been effective during emergencies such as flood, landslides and other natural as well as man-made emergencies (MMWR, 2012). As a general, close to universal coverage of districts is achieved a significant achievement. The current capacity and staff working at various levels of system in the country is an important step towards effective implementation of the System. A number of key factors could be identified for the successful implementation of the System. For instance political commitment at the higher levels, vision and leadership of the system and motivation of the system staff are foremost among these factors. Leadership and governance is very much important, particularly crucial in conflict areas where many donors and stakeholders keenly want to contribute but cannot actively work in the field because of political and logistical reasons. The technical assistance role of the WHO appears significant in the context of Afghanistan. However now it has been stand on its own foot and it is fully run by local staff. If linked properly, the system could help health professionals at local level for service delivery and national staff for strategic decisions. The system shows the links for preventive interventions such as vaccinations and outbreaks such as public health problem.

The main challenges being faced by the DEWS are logistic and security issues, coordination with other stakeholders, turnover of human resource in terms of focal points, and financial dependence on donors. On the other hand, the existence fragmented disease surveillance such as for TB, malaria, HIV, and polio are not efficient and sustainable. Currently, these challenges are tried to be managed through establishment of integrated diseases surveillance system (IDSR) to which there is strong political commitment from government and WHO.

The quality of reporting and investigations should be improved at grass root levels. There is a need for improved practical training of health providers who are working as focal point in sentinel sites for surveillance system. Sustainability of the system, reduction of turnover of staff, implementation of IHR-2005 and utilization and interpretation of information which is provided by DEWS should be

strengthened and encouraged.

In conclusion, the surveillance system (DEWS) in Afghanistan is a success story of effective public health surveillance system despite the poor security and war like situation that the country has faced on an ongoing basis. The DEWS in Afghanistan is an example that public health surveillance can be effectively implemented in fragile states. Given the high commitment and strong leadership, the system can continue providing high quality services to Afghan populations, manage the current challenges, and move on to the phase of integration, consolidation and sustainability. It has been a good system for conflict affected population such as Afghanistan which could link field level to home level staff. It is a dire need for the system if country wants to ensure implementation of IHR-2005, ensure its long-term effectiveness, the withdrawal of international support should be a slow and evolutionary process, and bilateral funding should phase out in a systematic manner rather than quitting abruptly. At the same time, the MOPH needs to enhance its financial contribution to the DEWS budgets to ensure the economic and implementation sustainability of the system and more works need to be done to enhance the response capacity of the health care system throughout the country to meet national and global challenges on the area of emerging and re-emerging diseases including pandemic preparedness.

Aknowledgement

We would like to thank all our focal points, surveillance officers and coordinators who are working diligently for reporting and controlling of outbreaks as recording and reporting of routine weekly data. Staff at surveillance/Disease Early Warning System is admired for their kind contribution in order to make this paper developed.

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Figure 1: Flow of DEWS reports and feedbacks

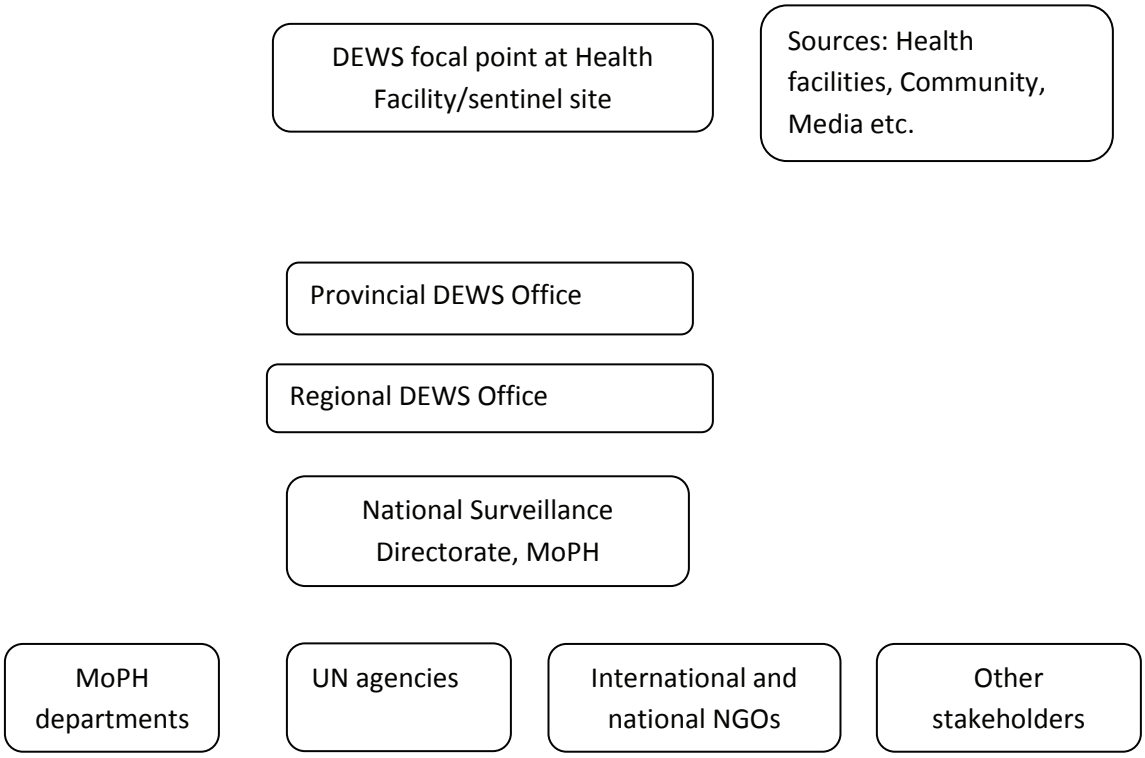


Figure 2: Distribution DEWS sentinel sites by types and locations, December 2015

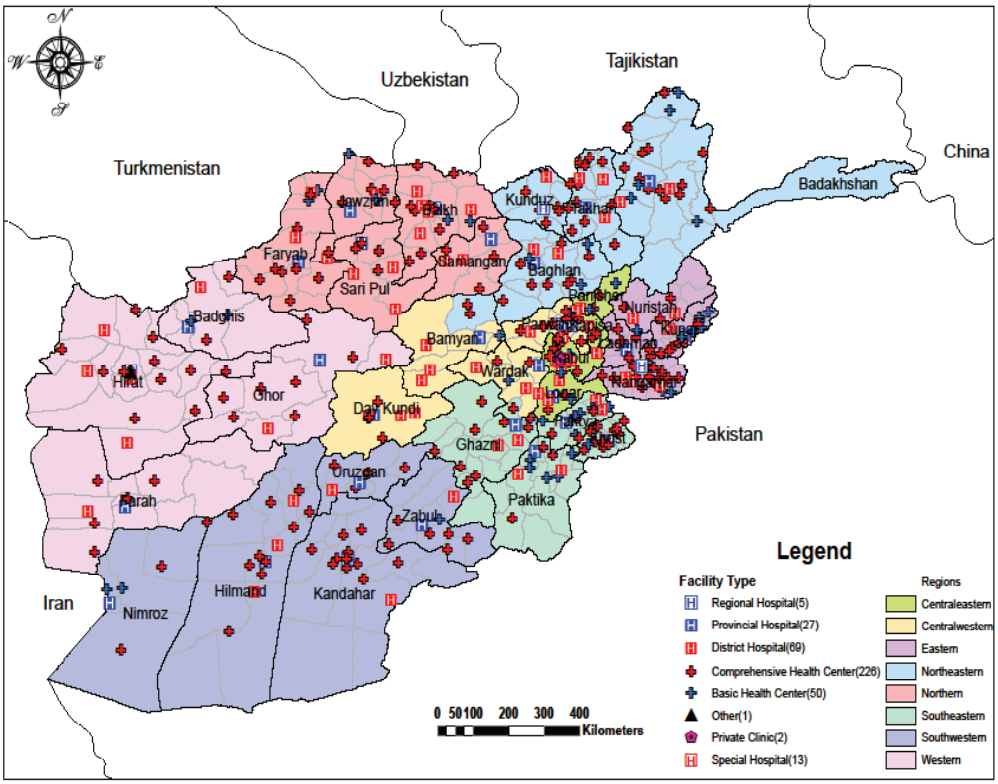


Figure 3: Cyclic Trend of ARI as percentages of total clients from 2007-2015

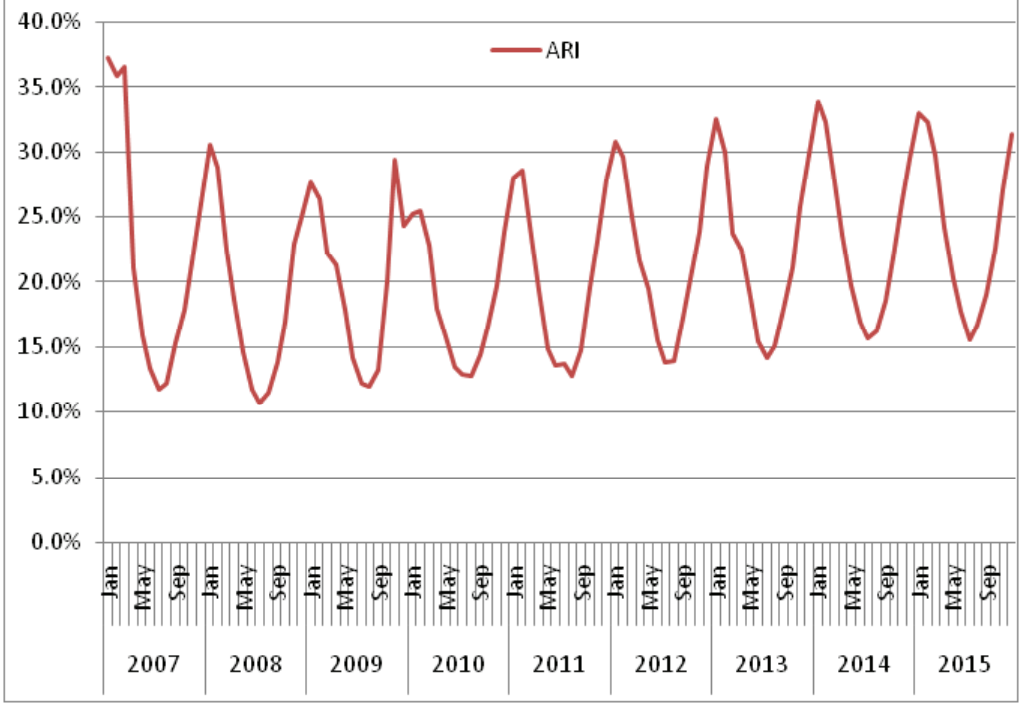
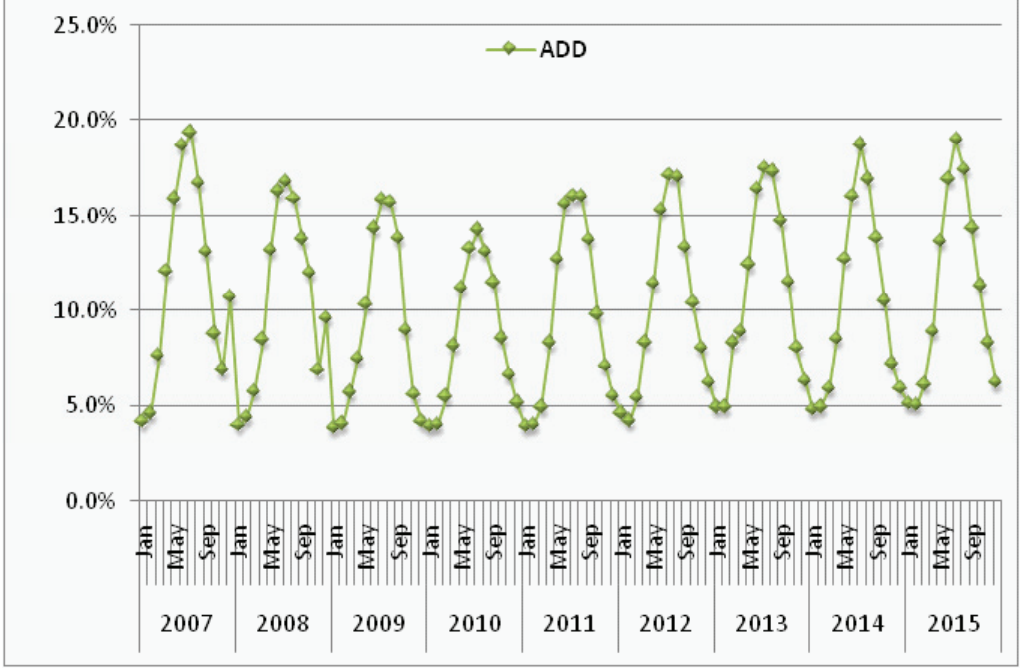


Figure 4: Cyclic Trend of acute Diarrheal Diseases as a percentage of total clients from 2009-2015 by months



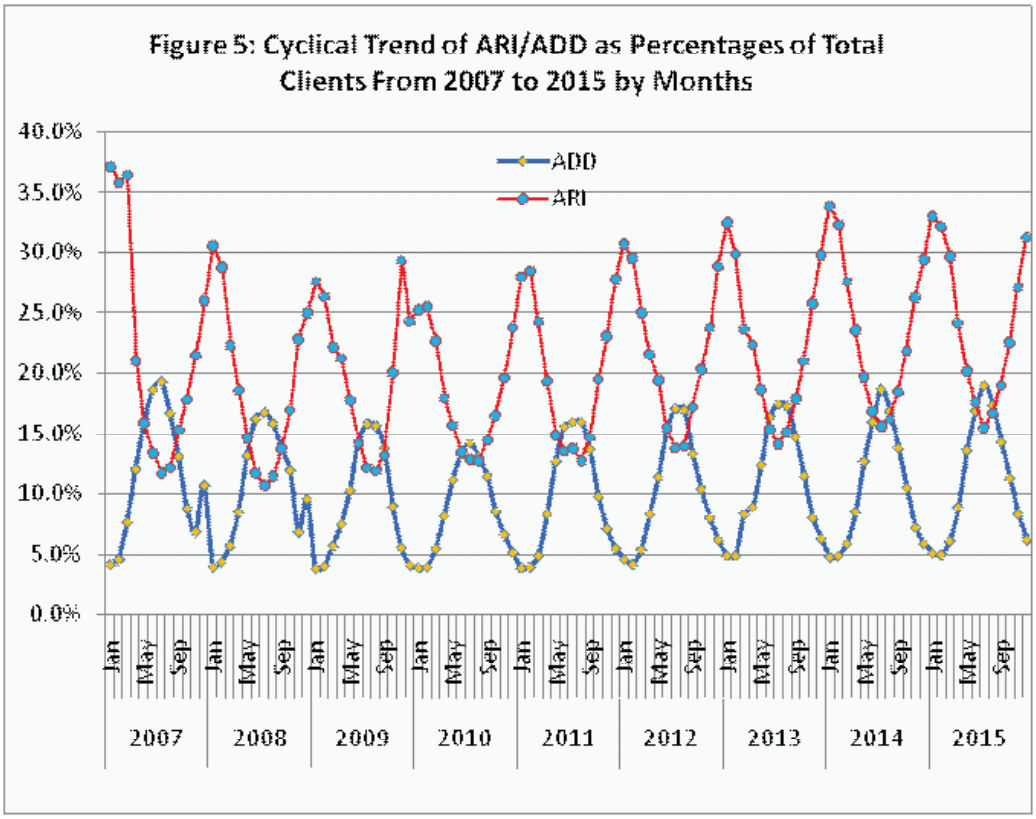


Figure 5: Cyclical Trend of ARI/ADD as Percentages of Total Clients From 2007 to 2015 by Months
40.0%
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
ADD
ARI
Jan
May
Sep
2007
2008
2009
2010
2011
2012
2013
2014
2015

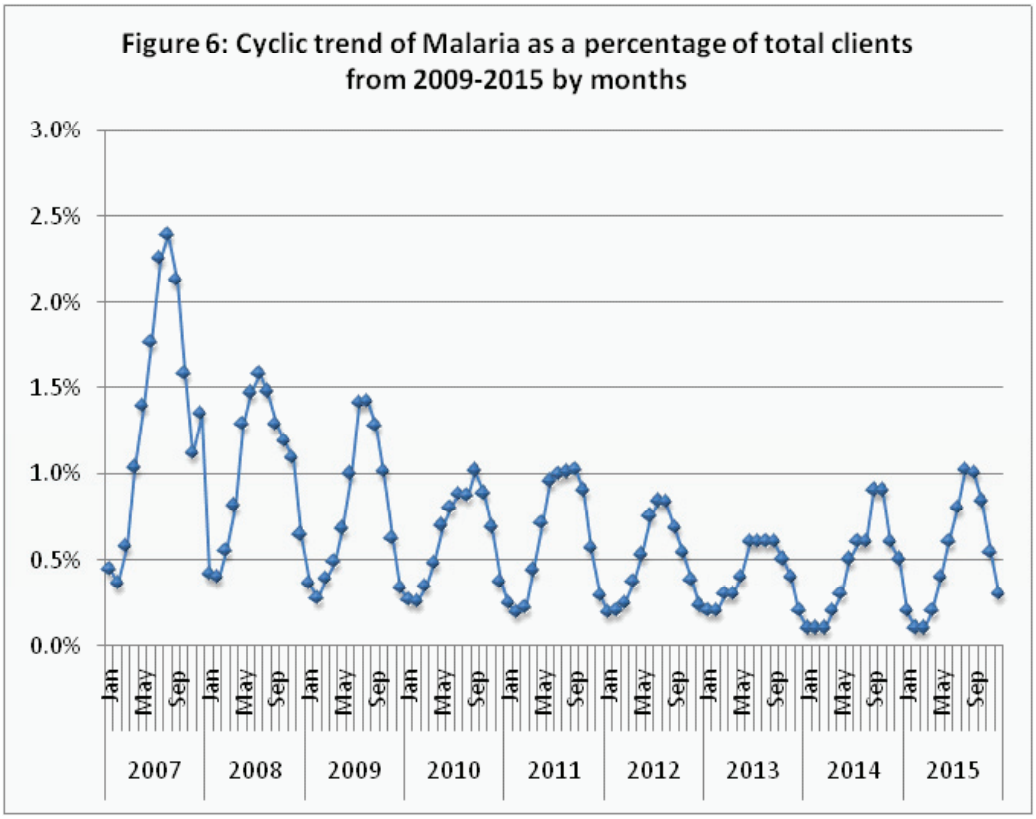


Figure 6: Cyclic trend of Malaria as a percentage of total clients from 2009-2015 by months
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
Jan
May
Sep
2007
2008
2009
2010
2011
2012
2013
2014
2015

Figure 7: Cyclic Trend of Typhoid Fever as a percentages of total clients from 2011-2015 by months

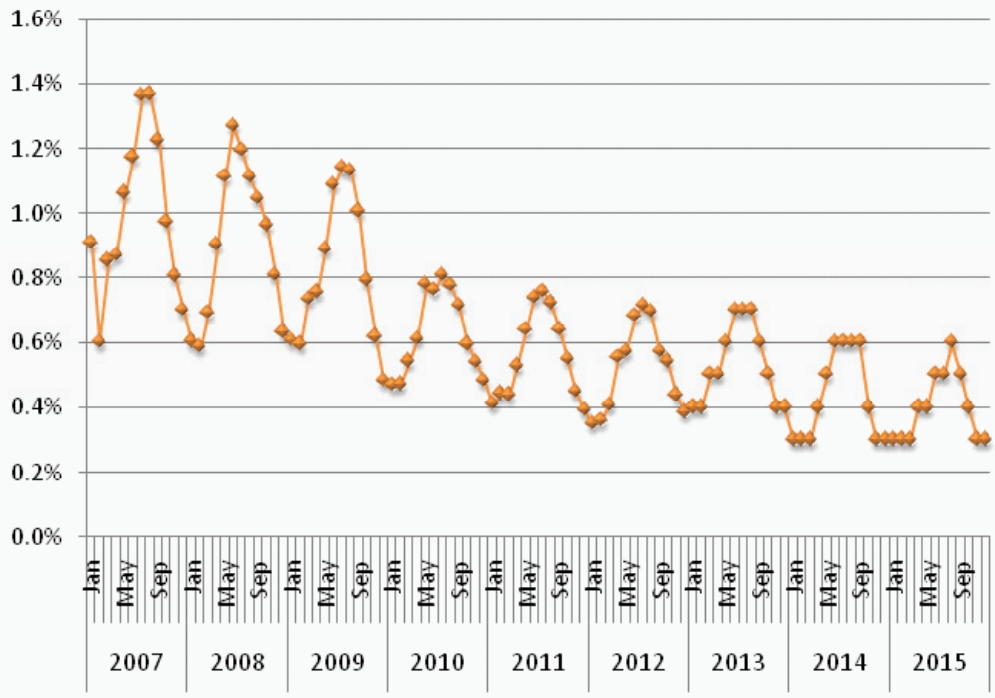


Figure 8: Cyclic Trend of Measles as a percentages of total clients from 2007-2015 by months

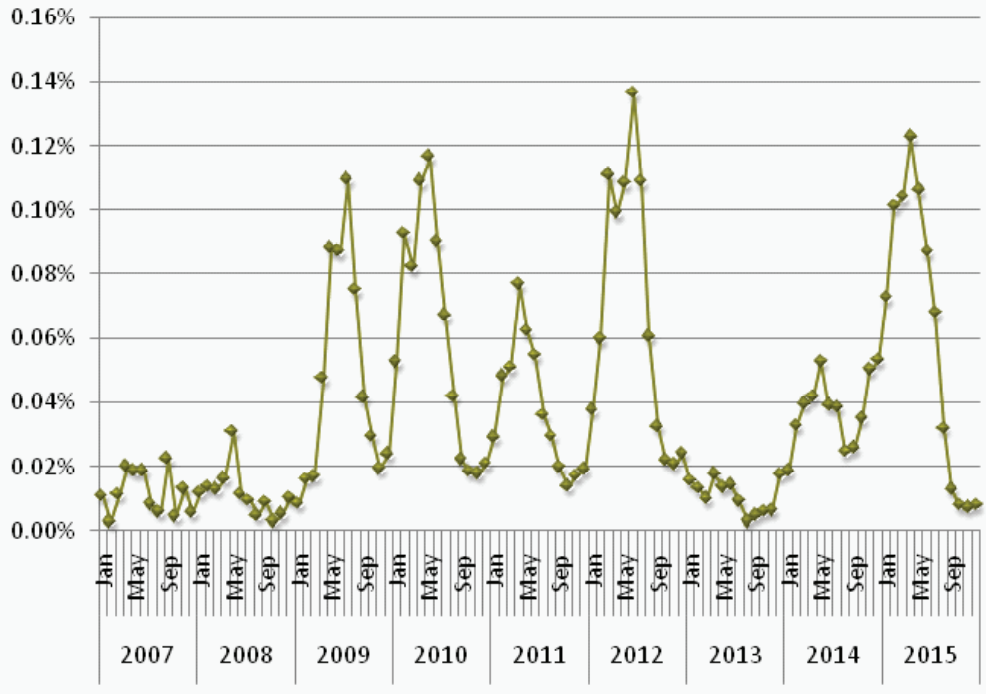


Figure 9: Top ten provinces with Pneumonia cases as percentage of total clients, 2015

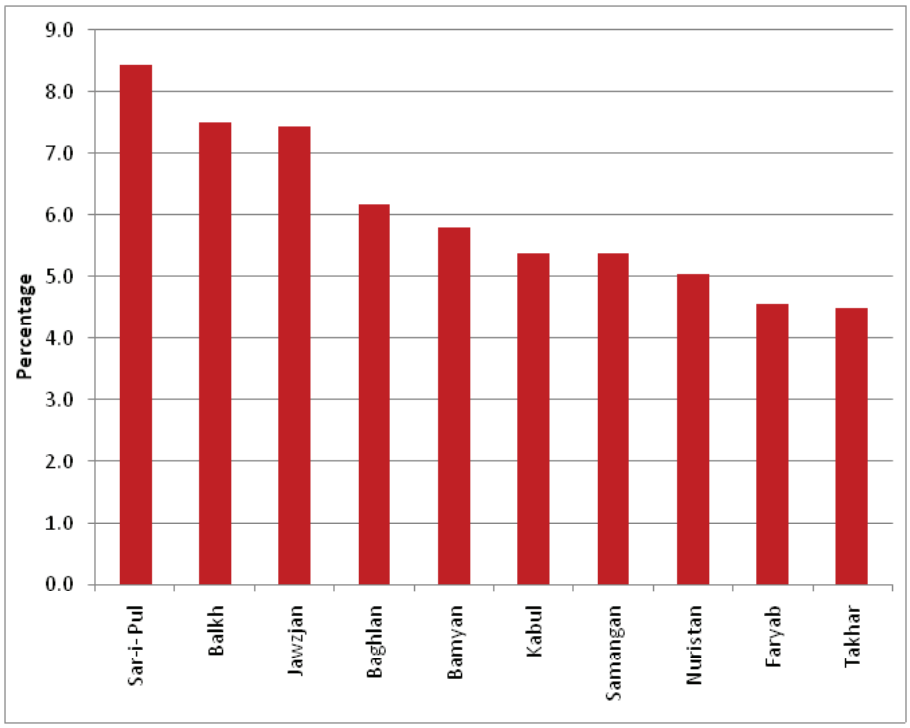


Figure 10: Top ten provinces with Figure 10: Top ten provinces with DD cases as percentage of total clients, 2015 cases as percentage of total clients, 2015

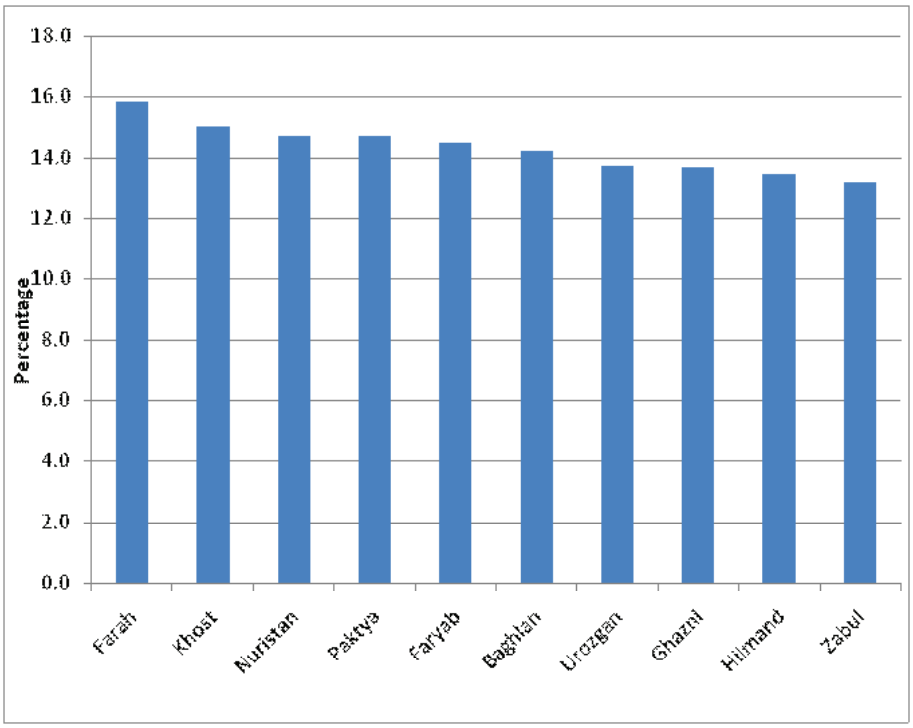


Figure 11: Top ten districts with measles cases as percentage of total clients, 2015

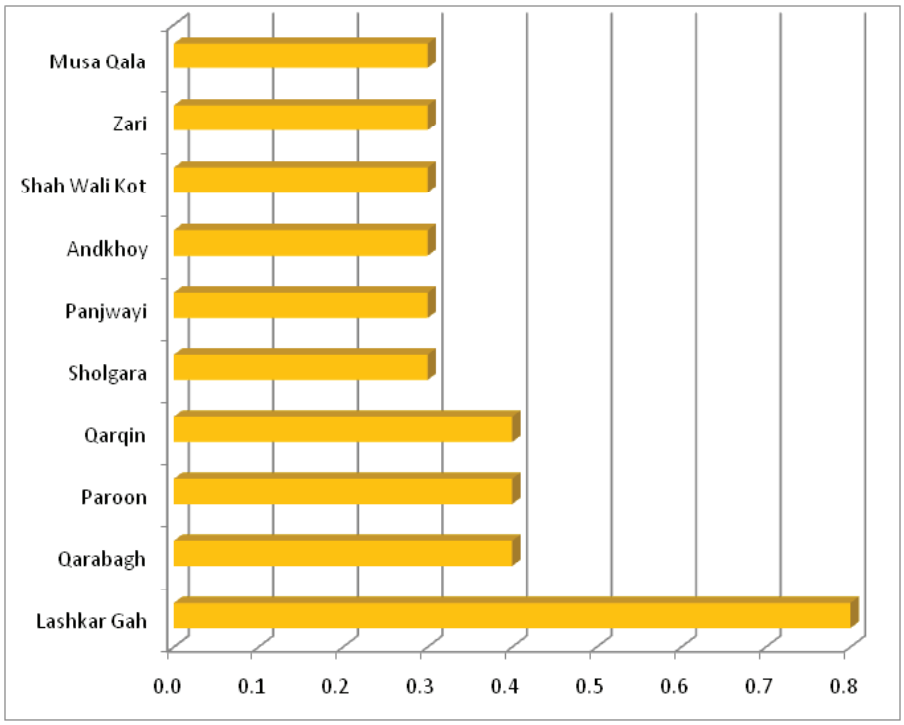


Figure 12: Top ten districts with malaria cases as percentage of total clients, 2015

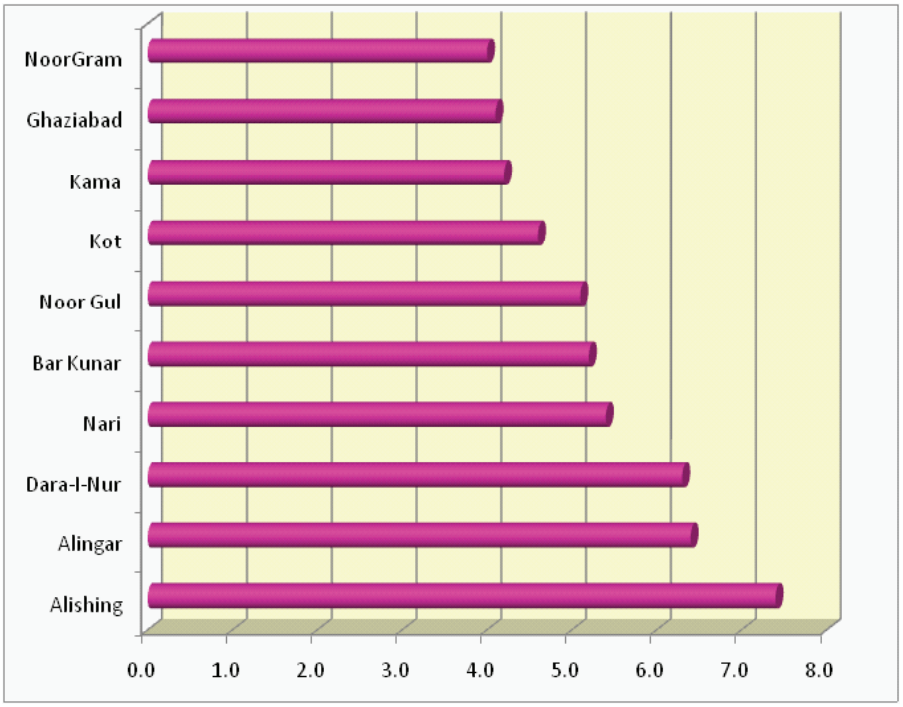


Figure 13: Density map of ARI (Pneumonia) as proportion of pneumonia cases from total clients in 2015

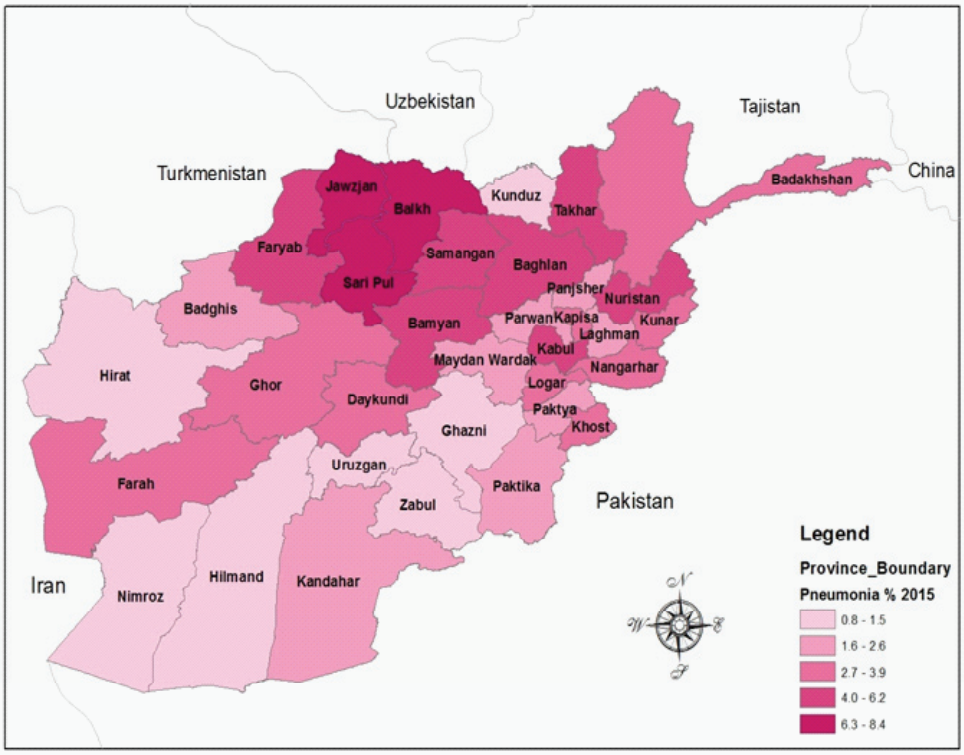


Figure 14: Density map of diarrheal diseases as proportion of diarrheal disease cases from total clients in 2015

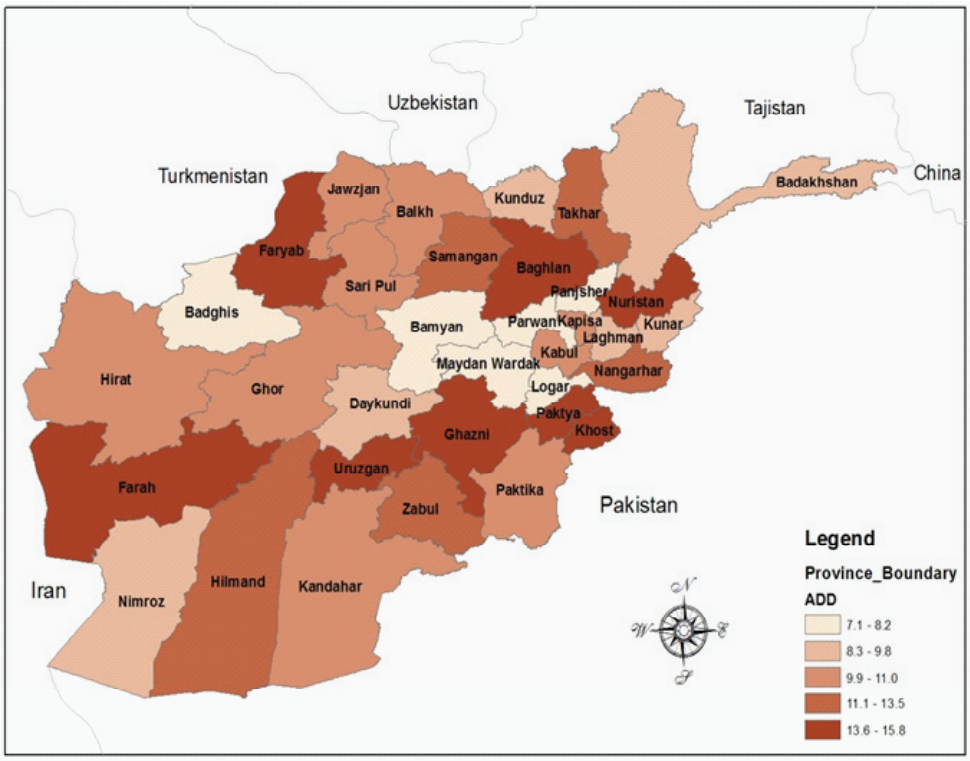


Figure 15: Density map of Measles as proportion of total clients in 2015

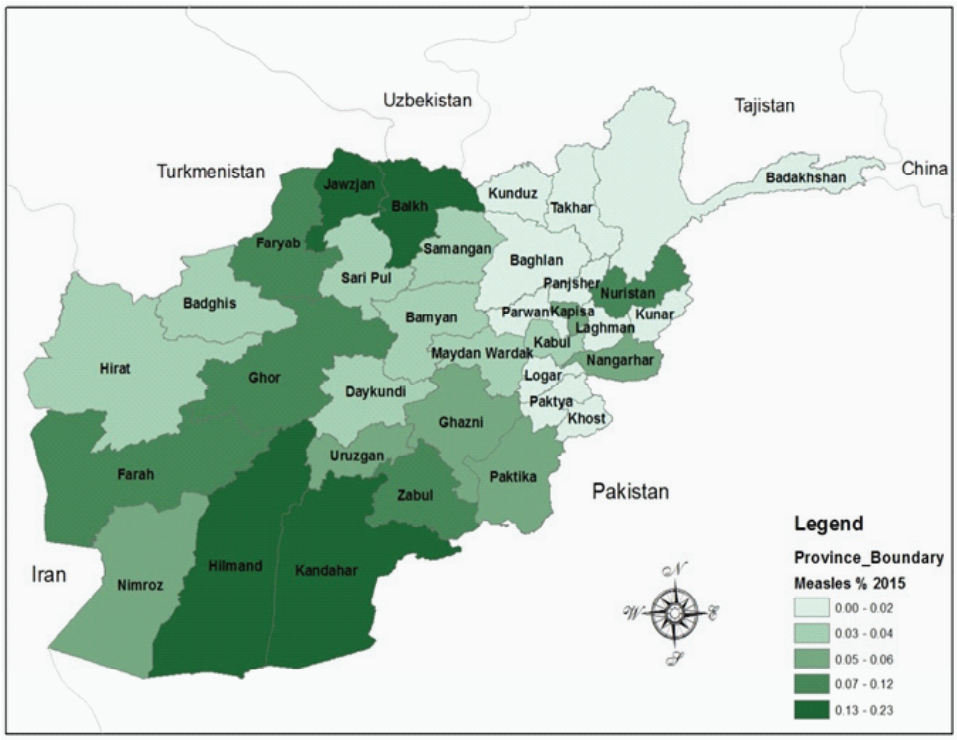


Figure 16: Density map of malaria proportion of total clients in 2015

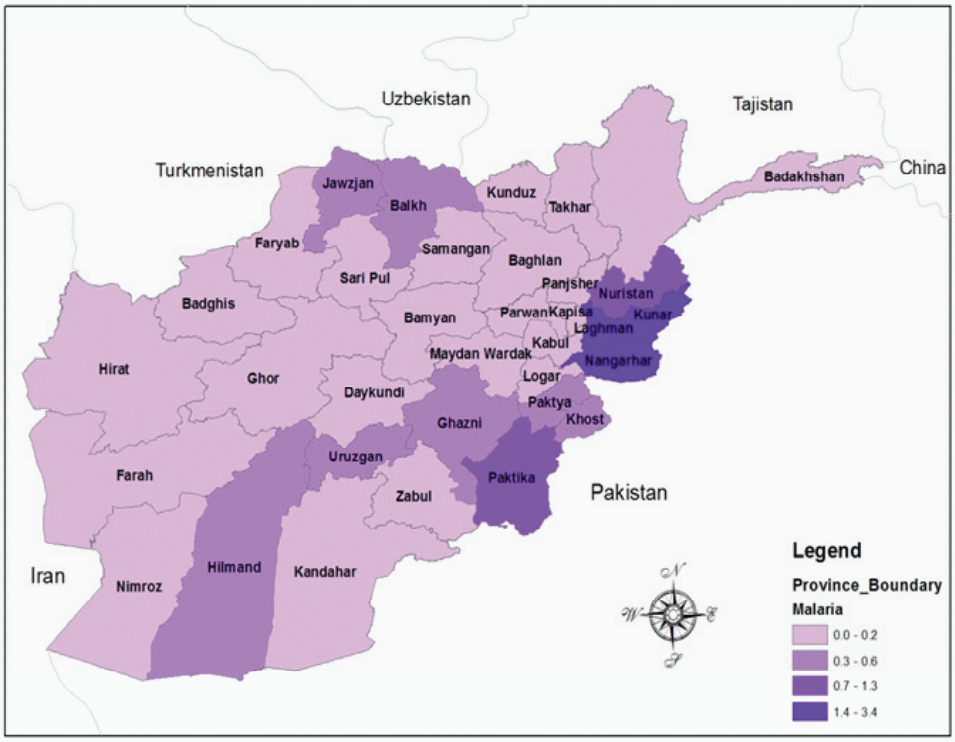


Figure 17: Trend of ARI (Pneumonia) by age groups in 2015

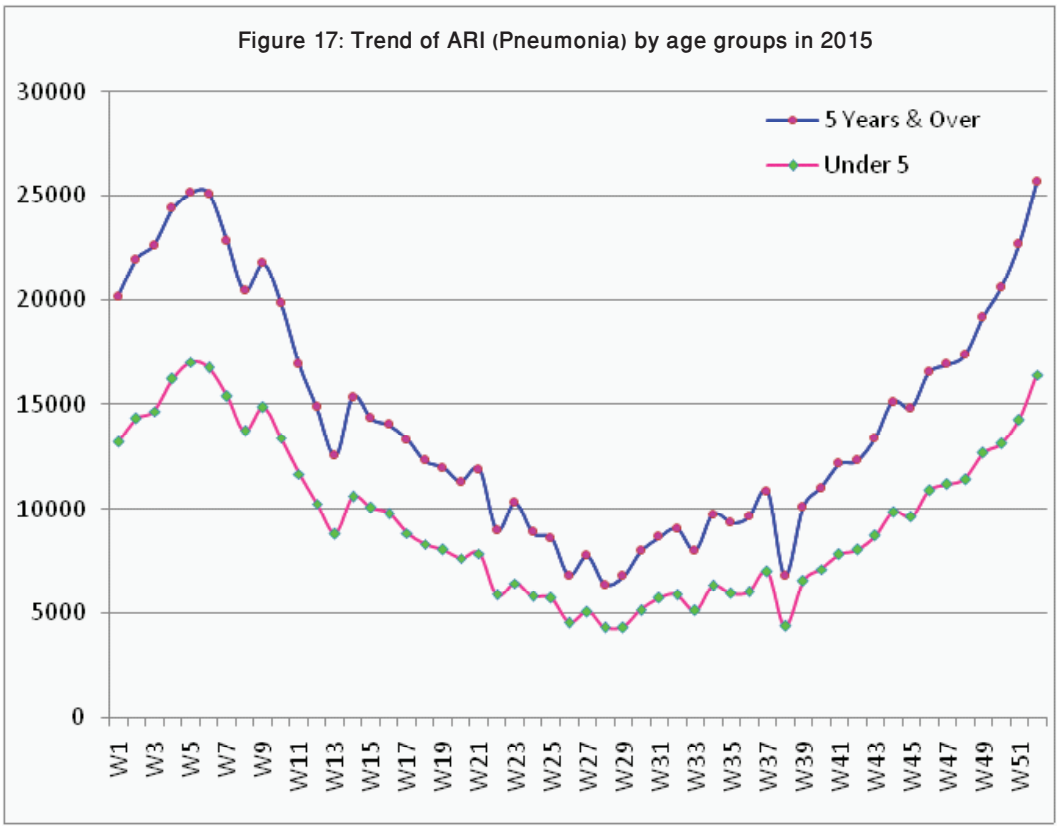


Figure 18: Trend of Diraheal Diseases by age groups in 2015

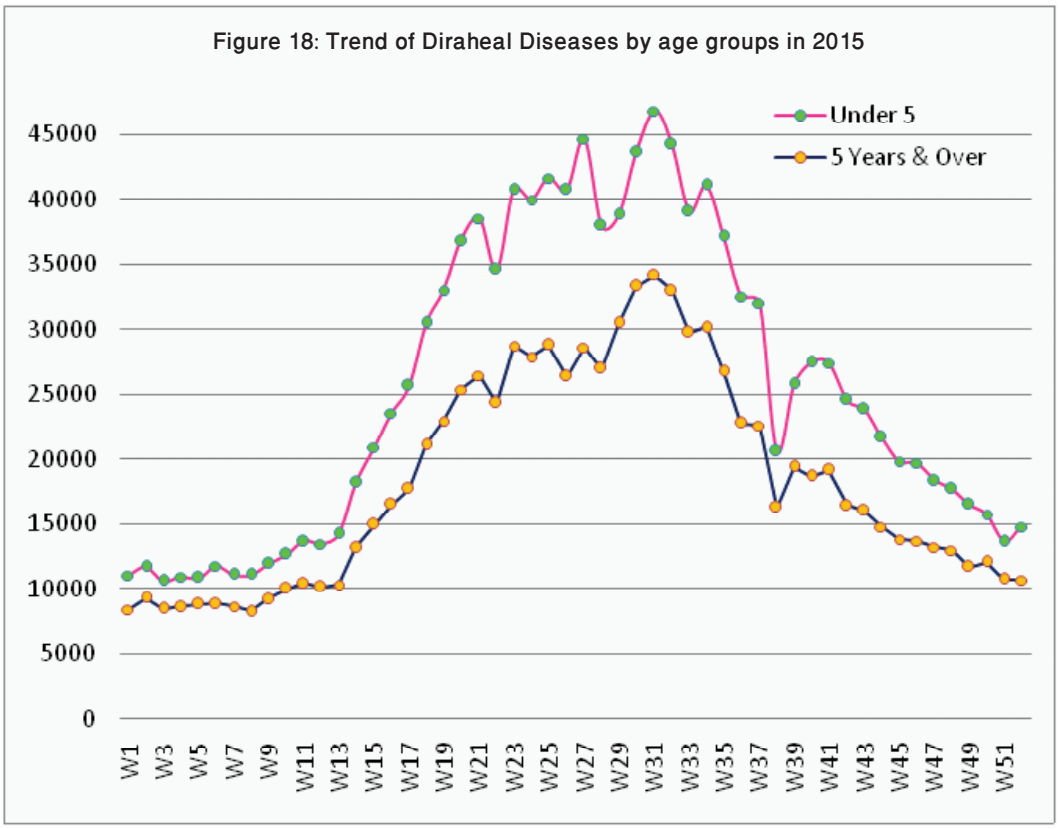


Figure 19: Trend of Measles by age group in 2015

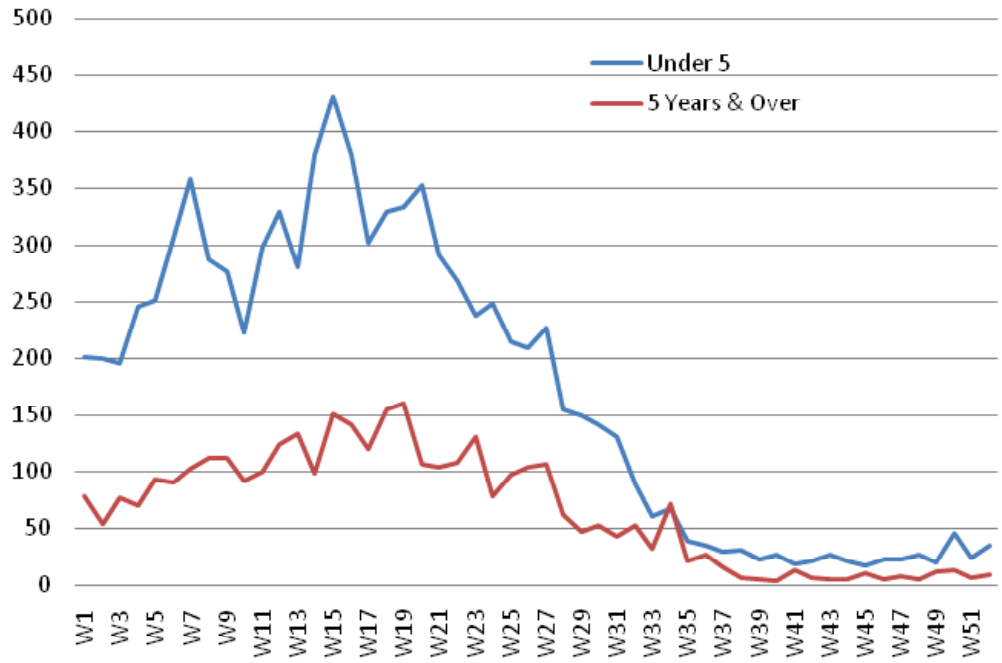


Figure 20: Trend typhiod fever by age group in 2015

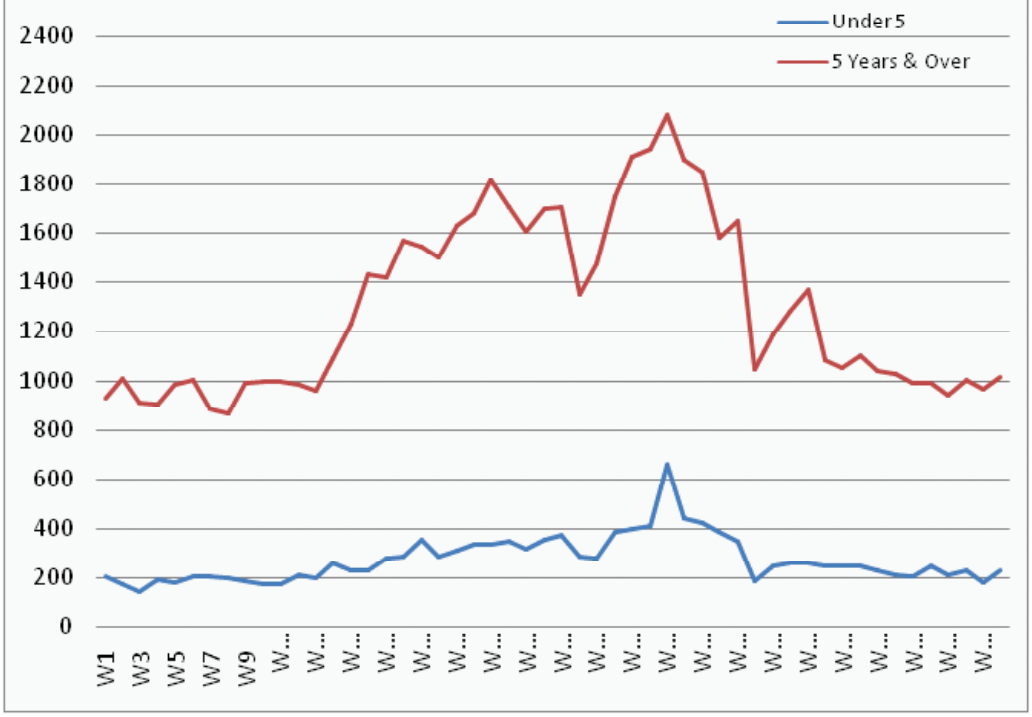


Figure 21: Percentages of ARI (Cough & Cold and Pneumonia) from total Clients by Age and Gender in 2014-2015

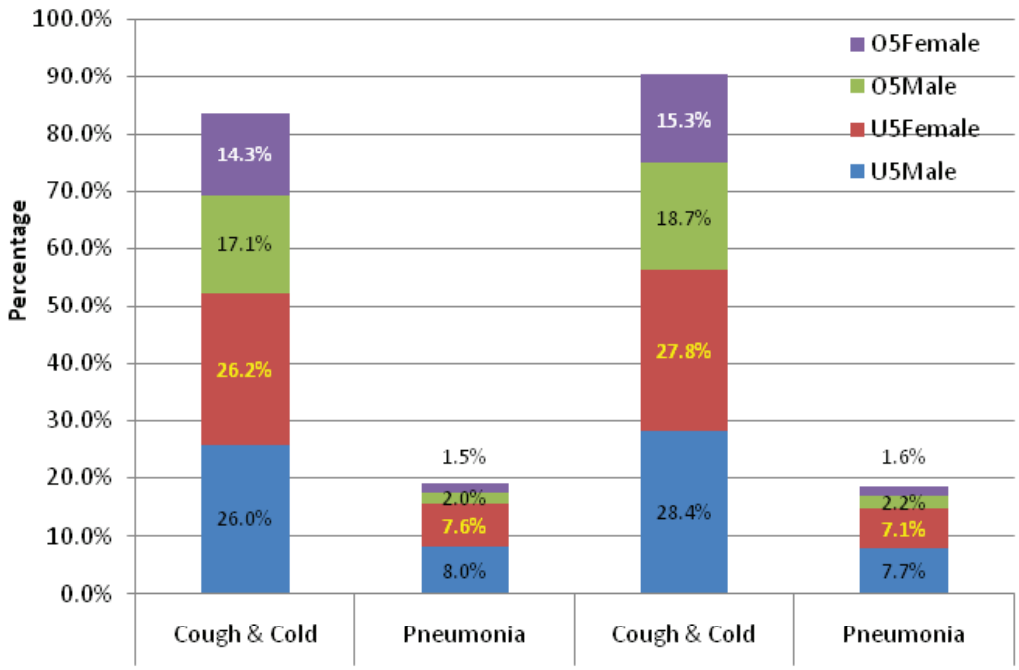


Figure 22: Percentages of ADD by Age groups and by Gender in 2014-2015

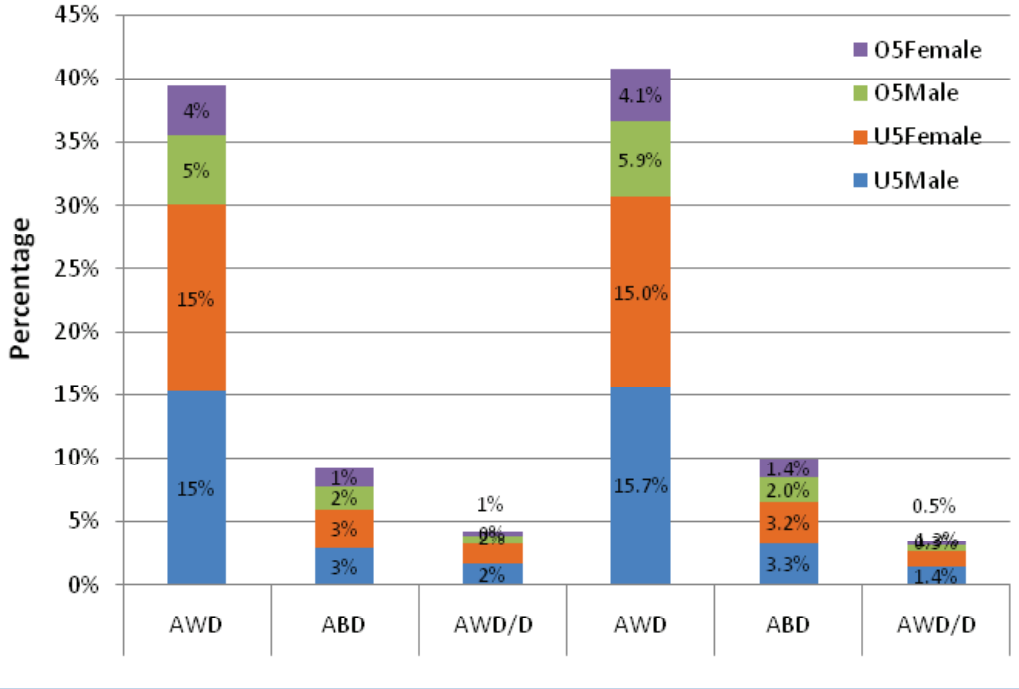


Figure 23: Typhoid Fever, Malaria and Men/SIC by age groups and by Gender in 2014-2015

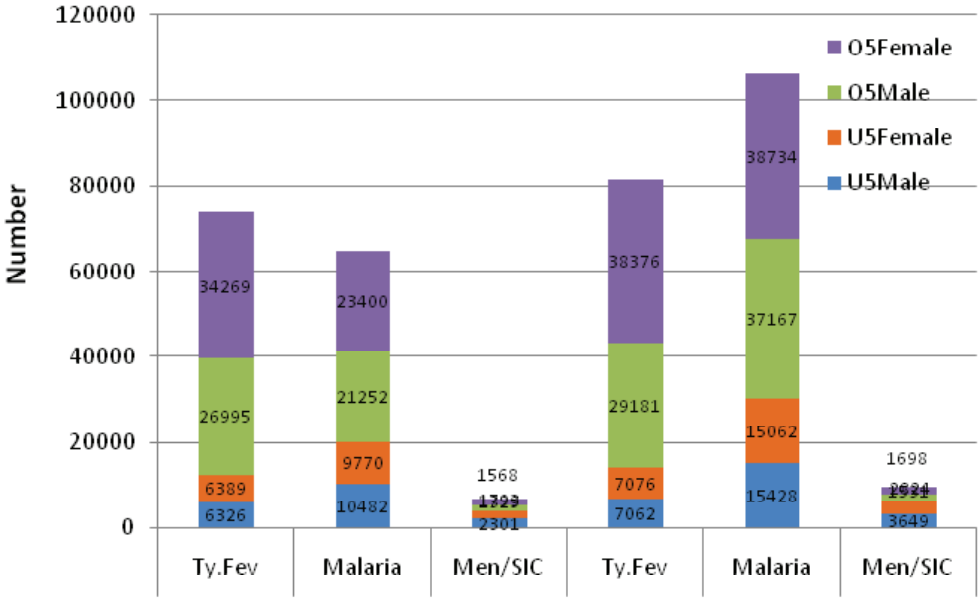


Figure 24: AVH and Measles Cases by age groups and by Gender in 2014-2015

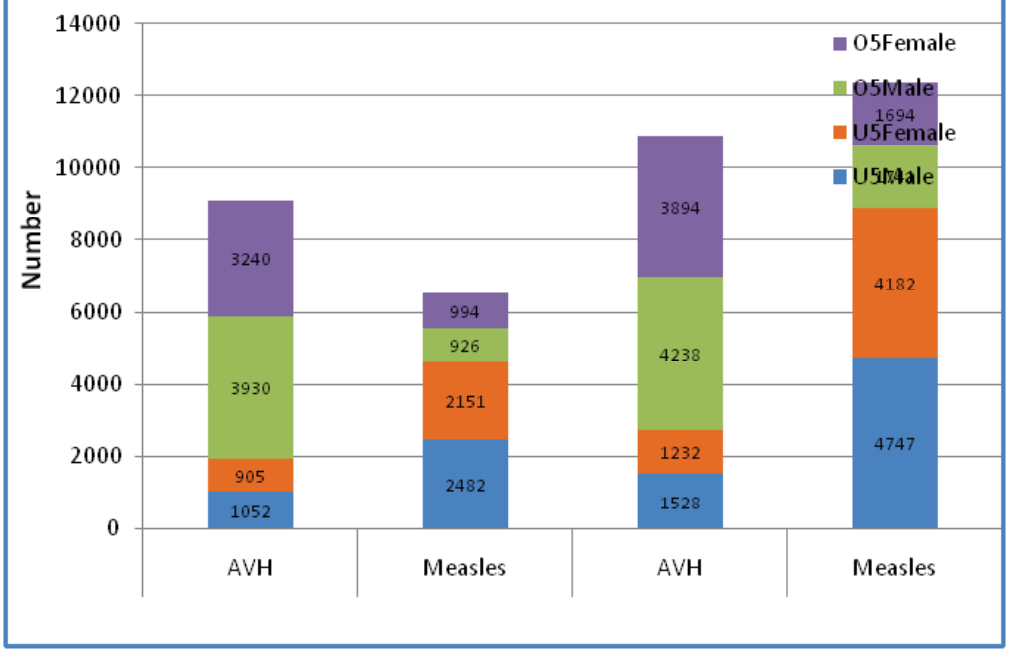


Figure 25: Outbreak Reports, 2007-2015

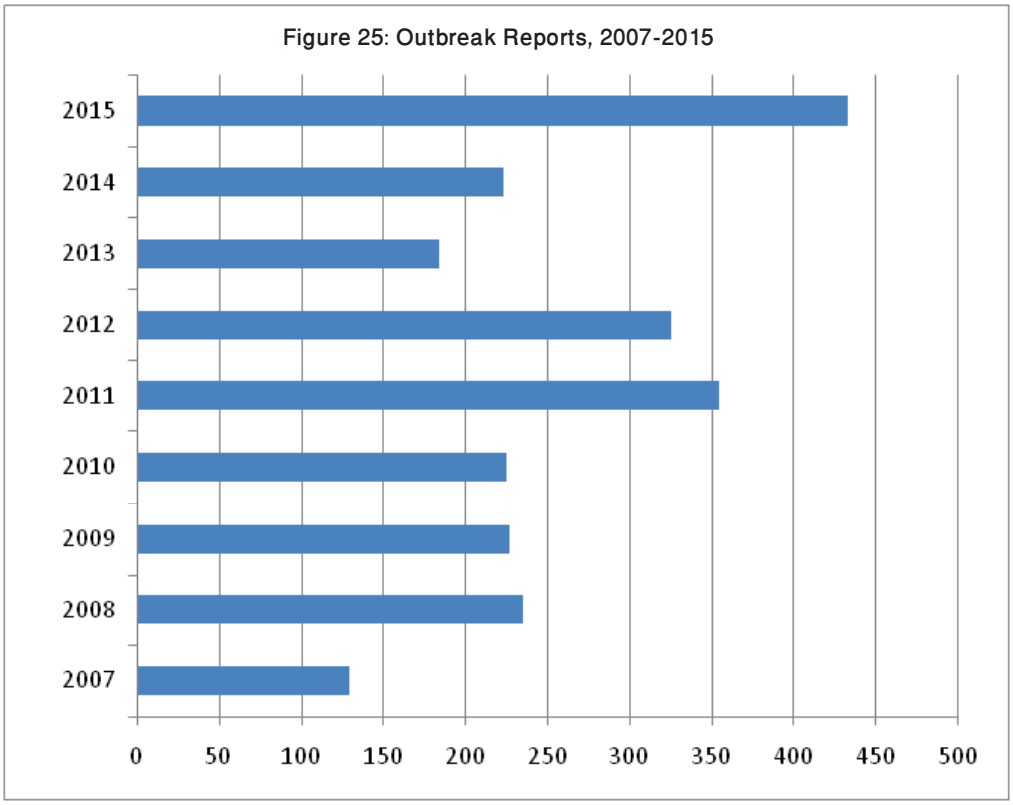


Figure 26: Main outbreaks comparison, 2007-2015

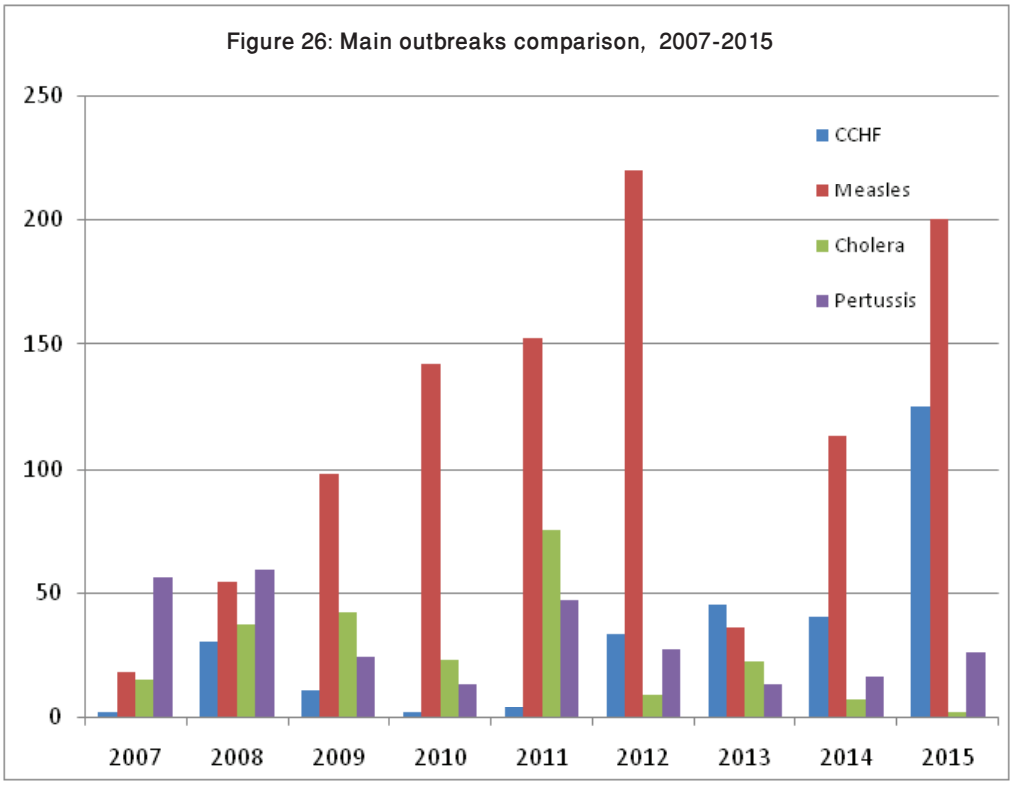


Table 1: Percentage of deaths out of total deaths occur in recorded in sentinel sites 2007-2015

Priority Health Problems	2007	2008	2009	2010	2011	2012	2013	2014	2015
ARI - Pneumonia	40.8	42.8	24.9	20.1	19.1	16.5	13.4	16.7	15.6
Acute Watery Diarrhea	4.6	6.5	1.5	1.5	2.07	1.4	1.1	1.7	1.7
Acute Bloody Diarrhea	1.0	0.7	0.2	0.2	0.24	0.2	0.1	0.1	0.1
AWD with Dehydration	10.7	13.7	5.1	2.7	2.33	1.8	1.8	1.8	1.4
Suspected Meningitis/ SIC	35.8	36.5	14.6	7.7	4.31	5.1	4.8	5.2	5.4
Suspected Acute Viral Hepatitis	3.03	1.1	1.3	0.7	0.37	0.3	0.4	0.2	0.4
Suspected Measles	0,0	0.0	0.1	0.4	0.1	0.4	0	0.5	1
Tetanus/ Neonatal Tetanus	1.08	1.1	0.5	0.3	0.33	0.4	0.3	0.2	0.1
Suspected Malaria	2.38	2.2	0.8	0.4	0.6	0.4	0.2	0.3	0.1
Suspected Typhoid Fever	0.65	0.7	0.2	0.1	0.05	0.1	0.0	0.0	0
Total DEWS events	100	100.0	51.0	35.9	30.5	27.5	22.6	27	26.4

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Patients Acquiring Medical Care Outside Afghanistan: A Descriptive Study

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Abstract

Introduction: Medical tourism is the private purchase and arrangement of medical care by patients across international borders. It has been growing continuously since the advancement of technology. Similarly, many patients travel to the countries in the region for seeking health care.

This study was designed to explore that why people wants to get medical care out of the country, what were the main problems/diseases for which people sought care abroad, and what were the main destinations where majority of the people got medical care. This study also explored the socio-demographic status of the respondents as well as the cost associated with each visit.

Methods: This study used descriptive design and a systematic sampling procedure to select participants who used medical care services abroad. In total 2,399 respondents were interviewed while returning back to the country. The study was conducted in all important borders of the country.

Results: The majority (62.5%) of the participants accepted that they were diagnosed with the same medical results in Afghanistan. Three quarters of the participants were not satisfied with diagnosis and treatment in Afghanistan i.e. 66.3%. Almost all of the respondents (99.6%) reported that they were properly treated. About 89% of the participants reported that doctors' behavior overseas was good or very good. Almost all of the participants (99.3%) stated that treatment out-of-the-country was better compared to Afghanistan. The analysis was performed using SPSS Version 20.

Conclusion: A large number of patients visit abroad for treatment via different borders and airports of the country. The doctor behavior with the patients inside the country was far worst in comparison to the overseas doctors as identified by the patients.

هغه ناروغان چې د افغانستان نه بهر د درملنې لپاره ځي: يوه څرګندوونکي څېړنه

دځېرنې لنډيز

پس منظر: طبی توریزم په شخصی مصارفودطبی خدمتونو دلاسته راوړلو او اخستلو په موخهد هیواد څخه بهرتللو ته وایي. طبي توريزم د تکنالوجۍ د انکشاف سره په نړيواله توګه ډير پرمختګ کړی دی. افغانستان يې هم تر اغيزې لاندې دی ځکهچې ډيری هيوادوال د ملک نه باندې د سيمې هيوادونو ته د تداوۍ لپاره سفر کوي.

موخې: د دې تشريحي څېړنې هدف دا وو چې ولې ډيری افغان ناروغان له هيواد نه بهر د تداوۍ لپاره ځي، دکومو طبی ستونزو يا ناروغيو له کبله بهر ته ځي، او کومو هيوادونو ته تداوۍ لپاره ډير ځي. همدارنګه نوموړي څېړنه د طبی توريزم سوشيو-ډيموګرافيک ارتباط او په اوسط ډول د هر سفر لګښت هم په ګوته کوي.

ميتودولوژي:دغه تشريحي څېړنه په يوه مقطع کې د هغه ناروغانو يوه سيستماتيکه نمونه تر مطالعې لاندی نيسي کوم چې د هيواد نه بهر د تداوۍ لپاره تللی وي. په دغه څېړنه کې 2,399 ناروغانو سره چې د هيواد نه بهر د درملنې لپاره تللی وو مرکه شوي ده. دغه څېړنه د هيواد په مختلفو مهمو سرحداتوکې ترسره شوي ده.

پايلې: دراټولو شوو ارقامو تحليل په SPSS Version 20کې ترسره شوی. نږدې اکثريت (62.5%) ناروغانو دا ويلي دي چې دوی په افغانستان کي د عين طبی نتايجو سره

تشخیص شوي دي. تقریبا دری ثلثه (66.3%) ځواب ویونکو ویلي دي چې دوی په افغانستان کي د تشخیص او تداوۍ سره راضي نه وو. کابو ټولو (99.6%) ناروغانو ویلي چې دوی په بهر کي په سمه توګه تداوي شوي دي. نهه اتیا سلنه (89%) ناروغانو ویلي چې د داکترانو سلوک ورسره په بهر کي ښه او یا ډیر ښه وو. نژدي ټولو (99.3%) ناروغانو ویلي چې په بهر کي تداوي د افغانستان په پرتله ډیره ښه وه.

وړاندیزونه: ښکاره ده چې یوه ډیره لوړه سلنه خلک د وطن نه د باندي د درملنی لپاره سفر کوي. همدارنګه د داکترانو سلوک د ناروغانو سره په افغانستان کې د بهر په پرتله ډیر خراب وو.

Introduction

Medical tourism is the private purchase and arrangement of medical care by patients across international borders (Johnson et al, 2012). Medical tourism also refers to "travel with the express purpose of obtaining health services abroad" (Crooks et al, 2010). Indeed, medical tourism has been growing continuously since the development of information technology that can instantly transmit information from service providers on diverse medical services to the health care seekers. Usually people travel to other countries to obtain access to procedures (typically via out-of-pocket payment) such as cardiac, orthopaedic, dental, and plastic surgeries that are unavailable to them in their home countries due to lack of affordability, lack of availability, and/or lengthy waiting lists (Crooks et al, 2010). On the contrary, in Afghanistan poor behavior of health providers, poor healthcare, and misguided treatment are the pushing factors for many potential domestic users of tertiary care facilities to seek their treatment from regional providers, such as Pakistan, India, Iran, Turkey and Dubai.

The existing research has significant details on inpatient and outpatient profiles and the public hospital users, but it does not capture comprehensive information on the determinants of decision-making of patients regarding travelling abroad for seeking health. In addition, there is lack of information on reasons for seeking health care if similar medical services are provided in-country. The Afghanistan Mortality Survey (2010) avails useful information on inpatient and outpatient health expenditures, which is an essential part of understanding the public's ability to pay, the breakdown of costs into medicines, diagnostics, transportation, and intangibles. However, the AMS (2010) does not go into detail on what services are received and what are the factors influencing the decision of patients in choosing their service provider.

In order to improve the demand for services coming from MoPH supported health facilities, it is very critical to understand whether it is the quality of care, prices, services provided or a general mistrust of domestic private healthcare providers that influence health care seekers to travel out of the country. This study determines the types of medical services Afghans receive outside the country, the reasons they seek care abroad, their opinion of the quality of care received in Afghanistan and abroad, and the amount of money they spent on medical care.

Methodology

The study was designed to select a systematic sample of all persons returning from abroad who introduce themselves as having received treatment outside the country. As people entered the immigration area, an announcement was made for all medical travelers to move to this separate line. After their passports were stamped and returned to them, then the individuals were selected systematically everyday based on the availability of the data collectors. The individuals who provided written informed consent were enrolled to the

study. If the patient was younger than 18 years, the parent's or guardian's written consent was obtained. If the parents or guardians were not present, the minors were excluded.

There were nine data collection teams working in different borders of Afghanistan who were locally recruited from the Provincial Health Directorates. The teams were trained on the principles of quantitative data collection, instrument administration, ethical norms, and the procedures of administering the consent statement for participation in the study. For open-ended questions, data collectors were trained on how to elicit information, opinions, and comments and how to adequately capture qualitative information. The survey instruments were pretested at the Hamid Karzai International Airport. Data collection was overseen by a supervisor with random checks on data quality carried out by the central management team at the Ministry of Public Health.

Torkhum, Spinboldak, Zaranj, Islam Qala, Hairatan, Shir Khan, and Ishkashim borders and Hamid Karzai and Kandahar international airports were selected as the study sites. These locations represented about 90% of all border crossings in the country.

Data analysis was performed using SPSS software. Descriptive analysis was done by calculating means and standard deviation for quantitative variables. The average direct and indirect cost associated with medical treatment was calculated for patients acquired treatment outside of the country. Proportions were calculated for qualitative variables (nominal and ordinal). Appropriate tests were used to examine differences.

The study was submitted to the Institutional Review Board within the Ministry of Public Health for ethical approval. Subjects were assured of the confidentiality of their answers and the interview was preceded with their written consent.

Results

The total participants interviewed in this study were 2,399 in different borders such as Hamid Karzai/Kandahar international airports (445), Torkham (1151), Spinboldak (513), Zaranj (197), and Islam Qala (93). Males comprised the main (81%) visitors getting health care abroad in comparison to females (19%). The mean age of the respondents was 35 years.

Table 1: Description of patients receiving health care from different countries

Variable		Airport (Kabul/Kandahar)		Torkham		Spinboldak		Zaranj		Islam Qila		Total	
Name	Description	N	% Mean (SD)	N	% Mean (SD)	N	% Mean (SD)	N	% Mean (SD)	N	% Mean (SD)	N	% Mean (SD)
Sex	Male	254	59.9	924	82.1	498	97.6	164	86.3	56	62.2	1896	81.0
	Female	170	40.1	202	17.9	12	2.4	26	13.7	34	37.8	444	19.0
Age	Years	43	33.9 (18.6)	721	37.0 (17.0)	354	31.9 (13.5)	92	35.1 (14.1)	92	32.1 (14.0)	1302	35.1 (15.9)

Table 2: Perception of respondents about diagnosis and treatment in Afghanistan

Variable		Airport (Kabul/ Kandahar)	Torkham	Spin Boldak	Zaranj	Islam Qila	Total
Name	Description	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Diagnosed in Afghanistan with same disease in any health facility	Yes	256 (60.7)	738 (65.6)	196 (38.6)	179 (99.4)	85 (92.4)	1454 (62.5)
Have you received treatment in Afghanistan	Yes	253 (60.4)	832 (73.6)	368 (73.7)	137 (98.6)	62 (68.1)	1652 (72.5)
Your satisfaction regarding diagnosis and treatment in Afghanistan	Very much dissatisfied	104 (24.4)	246 (22.0)	103 (20.2)	1 (0.5)	4 (4.3)	458 (19.6)
	Dissatisfied	164 (39.0)	417 (37.3)	278 (54.4)	0 (0.0)	85 (91.4)	944 (40.4)
	Satisfied	114 (27.1)	412 (36.9)	83 (16.2)	187 (95.4)	1 (1.1)	797 (34.1)
	Very much satisfied	22 (5.2)	7 (0.6)	0 (0.0)	8 (4.1)	0 (0.0)	37 (1.6)
	No opinion	16 (3.8)	36 (3.2)	47 (9.2)	0 (0.0)	3 (3.2)	102 (4.4)
Opinion regarding health workers behavior in Afghanistan	Very bad	67 (15.7)	163 (14.6)	56 (10.9)	0 (0.0)	13 (14.0)	299 (12.7)
	Bad	113 (26.5)	361 (32.2)	107 (20.9)	0 (0.0)	77 (82.8)	658 (28.0)
	Good	203 (47.5)	551 (49.2)	320 (62.5)	68 (34.7)	0 (0.0)	1142 (48.6)
	Very good	31 (7.3)	10 (0.9)	1 (0.2)	128 (65.3)	1 (1.1)	171 (7.3)
	No opinion	13 (3.0)	35 (3.1)	28 (5.5)	0 (0.0)	2 (2.2)	78 (3.3)

The majority of the participants (62.5%) accepted that they were diagnosed with the same results in Afghanistan. Among them, 72.5% tried treatment inside the country before visiting abroad. Three quarters of respondents (74.5%) mentioned pocket money as the main source of income for treatment in Afghanistan. Almost 66% of the participants were not satisfied with diagnosis and treatment in Afghanistan. Almost 40%of participants reported that the doctors' behavior was bad or very bad. Almost all of the participants (98.9%) said that they were diagnosed in abroad. The majority of the people who visited abroad received treatment in private health care hospital/ clinic/doctor. Seventy percent of the respondents reported that they were requested to have another visit for the treatment of their existing medical condition. More than three quarters (76.2%) of the participants said that they had the plan to continue treatment in the same health facility abroad where they were diagnosed and treated.

Table 3: Perception of respondents about treatment abroad

Variable		Airport (Kabul/ Kandahar)	Torkham	Spin Boldak	Zaranj	Islam Qila	Total
Name	Description	N	N (%)	N (%)	N (%)	N (%)	N (%)
Have you diagnosed in abroad for this disease in their health facility	Yes	414 (97.9)	1097 (99.1)	478 (98.6)	189 (100)	92 (100.0)	2270 (98.9)
Have you received proper treatment abroad	Yes	432 (98.9)	1129 (99.7)	505 (100.0)	194 (100)	92 (98.9)	2352 (99.6)
Have you invited for other visit	Yes	243 (56.5)	917 (82.3)	209 (41.4)	187 (95.9)	89 (95.7)	1645 (70.4)
Have you plan to continue the treatment in the same health facility	Yes	296 (79.4)	865 (79.4)	270 (55.2)	183 (97.9)	87 (93.5)	1701 (76.2)
What was the source of money for treatment in abroad	Own money	286 (68.6)	703 (62.1)	357 (69.6)	193 (99.5)	91 (100.0)	1630 (69.5)
	Borrow	103 (24.7)	413 (36.5)	153 (29.8)	0 (0.0)	0 (0.0)	669 (28.5)
	Sold household assets	12 (2.9)	6 (0.5)	2 (0.4)	0 (0.0)	0 (0.0)	20 (0.9)
Why you decided to visit abroad for treatment	I was referred by doctor	112 (26.7)	219 (19.6)	29 (5.8)	9 (4.7)	15 (16.1)	384 (16.5)
	Appropriate health care is not available in Afghanistan	190 (45.2)	642 (57.5)	106 (21.0)	39 (20.3)	12 12.9	989 (42.5)
	It's time consuming in Afghanistan to get health care	5 (1.2)	6 (0.5)	7 (1.4)	1 (0.5)	5 (5.4)	24 (1.0)
	No safety in health care	9 (2.1)	4 (0.4)	0 (0.0)	52 (27.1)	0 (0.0)	65 (2.8)
	Quality of care is available in abroad	89 (21.2)	232 (20.8)	361 (71.6)	91 (47.4)	61 (65.6)	834 (35.9)
Are you satisfied with treatment in abroad	Yes	386 (94.4)	1097 (98.5)	501 (98.8)	167 (99.4)	90 (98.9)	2241 (97.9)
Your satisfaction regarding diagnosis and treatment in abroad	Very much dissatisfied	23 (5.3)	9 (0.8)	52 (10.2)	0 (0.0)	0 (0.0)	84 (3.5)
	dissatisfied	57 (13.2)	24 (2.1)	70 (13.7)	0 (0.0)	0 (0.0)	151 (3.5)
	Satisfied	212 (49.0)	785 (68.4)	387 (75.7)	135 (68.5)	80 (86.0)	1599 (67.1)
	Very much satisfied	137 (31.6)	327 (28.5)	2 (0.4)	61 (31.0)	13 (14.0)	540 (22.7)
Opinion regarding health workers behavior in Abroad	Very bad	6 (1.4)	7 (0.6)	1 (0.2)	0 (0.0)	0 (0.0)	14 (0.6)
	Bad	9 (2.1)	15 (1.3)	13 (2.5)	0 (0.0)	0 (0.0)	37 (1.6)
	Good	169 (38.9)	768 (66.9)	492 (95.9)	185 (93.9)	71 (76.3)	1685 (70.6)
	Very good	250 (57.6)	354 (30.8)	7 (1.4)	12 (6.1)	22 (23.7)	645 (27.0)
The treatment was better compared to Afghanistan	Yes	422 (97.7)	1102 (99.8)	494 (99.2)	191 (100)	92 (100)	2301 (99.3)

The participants who said that they were diagnosed by doctors abroad were 98.9% and the participants who reported that they were properly treated were 99.6%. 95.1% of the participants received treatment in the private sector. The majority of patients who visited abroad used their own money for medical care/travel expenses i.e. 69.5% but a good number of patients borrowed money for visit i.e. 28.5%. Almost all the participants were satisfied for treatment received abroad i.e.97.7%. About 89% of the participants reported that doctors behaviorabroad was good or very good and almost all the participants stated that treatment abroad was better compared to Afghanistan i.e. 99.3%.

The main reasons for opting care abroad were said that appropriate care is not available inside Afghanistan (42.1%) and quality of care is available abroad (35.9%), the participants who were referred by doctors from Afghanistan to visit abroad for advanced medical care was only 16.5%.

The average travel and treatment expenses abroad were 71,889 Afghani, and the cost is not equally distributed throughout the visited countries.

Table 4: Cost of treatment, accommodation, and transportation abroad (in Afghani)

Variable		Airport (Kabul/ Kandahar)	Torkham	Spinboldak	Zaranj	Islam Qila	Total
Name	Description	N (Average)	N (Average)	N (Average)	N (Average)	N (Average)	N (Average)
Total cost {[treatment] + (other cost)}	Afghani	424 [246229]	1139 [31114]	512 [9616]	197 [88330]	93 [84452]	2365 [71889]
Transportation cost (Not including ambulance)	Afghani	390 (80050)	737 (3156)	510 (4090)	197 (28597)	91 (21890)	1925 (22471)
Accommodation	Afghani	379 (81443)	653 (3338)	397 (1445)	197 (25710)	91 (29462)	1717 (24092)

The majority of the patients visited for illnesses related to peptic ulcer disease (11.5% of the total), orthopedic problems (7.7% of the total patients), CNS/mental illnesses (7% of the total patients) and urinary tract infections (6.5% of total patients).

Discussion

The big number of Afghan people visit neighboring countries for availing medical care. The people who visit abroad for medical care spend a lot of money on transportation, food and accommodation and spend a good number of days in availing medical care. It was important results that most of the people decided by their own to avail medical care outside of the country because very small number of people was referred by medical specialists. The main reasons for deciding to avail medical care abroad are said that appropriate care was not available inside the country or a good care was available abroad. The majority of the diseases for which care was availed abroad can be treated inside Afghanistan.

The opinion of the participants regarding health staff behavior inside the country was poor compared to the doctors abroad. The study teams also visited Sherkhan Bandar, Ishkashim, Hairatan Bandar but limited number of people crossing through those borders to Tajikistan and Uzbekistan and majority of the people visits to those borders were not seeking health care.

A large number of patients were visiting abroad for treatment through different borders of the country including Hamid Karzai and Kandahar international airports. The doctor behavior with the patients inside the country was far worst compare to doctors abroad as identified by the patients. The cost visiting to Pakistan was much less than the cost visiting Iran or other countries through Hamid Karzai Airport. Mainly patients were visiting for the problems which could be managed in the country; therefore, the patients trust on the current system was required and need to be built.

Conclusion

There were a large number of people visited different regional countries to acquire medical care. It was suggested by the study results that large number of patients could be treated inside Afghanistan with the current health system but one of the important reason to get medical care in the country was not having trust on medical care system and bad behavior of the medical staff. This study identified that the people who visited India or other countries through Hamid Karzai and Kandahar international airports spending large amount of money and also patients who visited Iran spent more money on medical care compared to Pakistan.

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Assessment of Laboratory Reporting Forms at Some Health Facilities in Kabul and Ghazni Provinces

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Abstract

Introduction: Laboratory reporting forms is an important document related to health condition and safety of individual patient, that even minor mistake in reporting can cause major health problems to the patient and public health system. On the other hand, the laboratory reporting forms are considered important documents to record diseases prevalence based on which we can perform statistical and epidemiological studies in the health sector and take preventive measures. Reporting the laboratory results in a substandard format and ignoring most specifications of a standard reporting form may lead to major consequences to the patient and community. Laboratory reports should be clear, unambiguous and contain sufficient information about the patient to enable the physician to interpret the results. The report form shall conform to the requirements of patients and the needs of the national and international surveillance systems.

Method: The objective of this study was to assess laboratory reporting forms atsome private and public clinical laboratories in Kabul and Ghazni provinces. In this cross-sectional study, we randomly collected 113 blank laboratory reporting forms from 55 private and public clinical laboratories according to population density in these two provinces.

Results: In this study, we found that about 82 percent of laboratory reporting forms contained spelling errors related to laboratory test names, 77 percent errors related to the normal range of laboratory tests, 36 percent without specific address, 2 percent without name of patients, 48 percent without name of referred doctor, and 10 percent without specific date.

Conclusion: Our findings show that most laboratory reporting forms, both in private and public sectors are not standard and there are a lot of errors in reporting lab results. It is necessary that lab reporting forms should be assessed and controlled by relevant bodies to ensure that they are in compliance with national and international standard formats.

چکیده

فورم نتایج لابراتواری یک سند مهم مربوط به وضعیت صحی و مصؤنیت هر مریض می باشد، که حتی کوچکترین اشتباه در راپوردهی منجر به مشکلات جدی صحی به مریض و سیستم صحی می شود. از طرف دیگر فورم نتایج لابراتواری برای ثبت شیوع امراض و مطالعات اپیدیمولوژیک و بالاخره اتخاذ تدابیر وقایوی خیلی مهم می باشد. گزارش دهی نتایج لابراتواری در یک فارمت غیر استاندرد و نادیده گرفتن بسیاری مشخصات راپوردهی منجر به عواقب جدی به مریض و جامعه شده می تواند. راپور های لابراتواری باید واضح، و حاوی معلومات کافی باشد تا طبیب قادر به تعبیر آنها باشد. راپور لابراتواری باید مطابق نیازمندی های مریضان و اصول سیستم سرویلانس ملی و بین المللی باشد.

میتود: هدف این تحقیق بررسی فورم نتایج لابراتواری از نگاه اشتباهات گرامری در نام آزمایش ها و سایر مشخصات مربوطه در یکتعداد تسهیلات صحی دولتی و شخصی در شهر کابل و غزنی بود. در این بررسی مقطع زمانی (Cross-sectional) به تعداد 113 فورم خالی نتایج لابراتوری چاپ شده از 55 لابراتوار شخصی و دولتی به شکل تصادفی از نواحی پرجمعیت از نقاط مختلف شهر کابل و شهر غزنی جمع آوری گردیده است.

نتایج: در این تحقیق ما دریافتیم که در حدود 82 فیصد فورم نتایج لابراتواری حاوی اشتباهات گرامری در نام آزمایش ها، 77 فیصد حاوی اشتباهات در محدوده نارمل آزمایش ها، 36 فیصد بدون آدرس مشخص لابراتوار، 2 فیصد بدون ذکر نام مریض، 48 فیصد بدون ذکر نام داکتر راجع کننده و 10 فیصد بدون تاریخ بود.

نتیجه گیری: در اخیر باید یاد آور شد که این امر ضروری خواهد بود تا فورم نتایج لابراتواری باید توسط مراجع مربوطه بررسی گردیده و مطابق به نیازمندی های ملی و بین المللی چاپ شوند.

بررسی مشکلات فورم نتایج لابراتواری در یک تعداد از تسهیلات صحی شهر کابل و غزنی

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معرفی

آزمایش های لابراتواری روتین، که طی آنها نمونه های مختلف بیولوژیک مانند خون، ادرار، چرک، مایع نخاع شوکی، تقشح، مواد غایطه، مایع منوی، بیوپسی یا اتوپسی و سایر نمونه های مرضی تحت مطالعه قرار می گیرد، در واقع به ادامه معاینات فزیکی بوده و تکمیل کننده تشخیص کلینیکی بسیاری امراض می باشد. این آزمایش ها شامل مطالعات مایکروسکوپیک، آزمایش های بیوشیمی، مایکروبیولوژی، سیرولوژی، ایمیونولوژی و هستولوژی بوده که نتایج آن باید در یک ورقه معلوماتی با فارمت مشخص، استاندرد و واضح تحریر گردد. اکثراً زمانیکه آزمایش لابراتواری با اطلاعات حاصله از تاریخچه مریض و سایر اعراض و علایم کلینیکی همراه می شود، نتایج حاصله از آن رهنمایی مناسب، مفید و دقیق را برای اجرای اهتمامات لازمه برای مریض در بر خواهد داشت (1). بنابر اهمیت آزمایش های لابراتواری و ارتباط مستقیم آنها با تشخیص و تداوی و وقایه امراض، فورم نتایج لابراتواری باید مطابق معیارات استاندرد بوده و راپور دهی باید به دقت کامل صورت گیرد. ناقص بودن فورم نتایج و راپوردهی نادرست و غیرمعیاری، باعث گمراه ساختن طبیب در تشخیص و تداوی امراض و همچنان زیان های جبران ناپذیر به خود مریض شده می تواند (2).

فورم نتایج لابراتواری یک سند مهم و مرتبط به صحت و سلامتی شخص می باشد که متاسفانه در بعضی موارد و جوامع تحریر نتایج و راپوردهی آن به صورت دقیق و استاندرد، دست کم و نادیده گرفته می شود. در بسا موارد کمترین اشتباه در راپور دهی میتواند مشکلات عمده صحی را سبب شود (3). همچنان راپور دهی نتیجه آزمایش یک شخص، به عوض شخص دیگر در صورتی که اسم و سایر مشخصات مریضان به صورت واضح درج نگردیده باشد، میتواند حتی به قیمت حیات شخص تمام شود. فورم نتایج لابراتواری همچنان یک سند مهم جهت ثبت شیوع امراض و آمار مربوط به آنها به منظور مطالعات اپیدیمولوژیک در بخش صحت عامه می باشد. راپور لابراتواری باید واضح، بدون ابهامات و حاوی معلومات کافی باشد که خواننده را قادر به تفسیر نتایج نماید. این راپور باید مطابق به نیازمندی های استفاده کنندگان و اصول سیستم ثبت آمار و ارقام و سیستم سرویلانس ملی و منطقوی باشد (4). راپور های لابراتواری باید شامل نام لابراتوار، مشخصات مریض، آدرس، نوع نمونه، تاریخ و زمان راپوردهی، محدوده های نارمل به قسم واضح و دقیق، داکتر راجع کننده و سایر مشخصات باشد که فورم نتایج لابراتواری را معیاری و مناسب سازند (5 و 6).

هدف این تحقیق بررسی فورم نتایج آزمایش های روتین بیولوژیکی در یکتعداد لابراتوار های شخصی و دولتی شهر کابل و غزنی بود که از نگاه طرز چاپ نتایج و خصوصیات راپور دهی معیاری مورد مطالعه قرار گرفته است.

میتود

در این بررسی مقطع زمانی (Cross-sectional) به تعداد 113 فورم خالی نتایج لابراتواری چاپ شده از 39 لابراتوار شخصی و 6 لابراتوار دولتی در کابل و 11 لابراتوار شخصی در شهر غزنی به شکل تصادفی از نواحی پر جمعیت از نقاط مختلف جمع آوری گردیده است. از اینکه معلومات دقیق در مورد تعداد لابراتوار ها و موقعیت آنها بدسترس نبود، معیار انتخاب لابراتوار ها در هر منطقه پرجمعیت به اساس فورمول یک در میان بود که به اساس مواجه شدن به لابراتوار اولی، سومی، پنجمی و غیره فورمه ها جمع آوری گردید تا قسماً نمایندگی از تمام لابراتوار های موجوده نموده بتواند. قبل از جمع آوری فورم های خالی نتایج لابراتواری موافقت هر لابراتوار در جمع آوری و بررسی فورم نتایج لابراتواری با مخفی نگهداشتن هویت آنها گرفته شد. این فورم ها از نگاه اغلاط املایی در نام آزمایش ها، درج مشخصات مریض و طبیب مربوطه، درج آدرس لابراتوار و شخص اجرا کننده آزمایشات لابراتواری و درج محدوده نارمل آزمایش ها مورد بررسی قرار گرفته است. تحلیل در برنامه اکسیل 2010 صورت گرفت و نتایج به شکل فیصدی ارائه شده است.

نتایج

در مجموع فورم خالی نتایج لابراتواری که از لابراتوار های دولتی در کابل و شهر غزنی جمع آوری گردید، شامل معاینات خون، مواد غایطه، سیرولوژی، معاینات بیوشیمی، ادرار و سپرم بود. در مجموع 82 فیصد فورم ها دارای اشتباهات

املایی در نام آزمایش ها و 77 فیصد شامل اشتباهات در محدوده نارمل (این اشتباهات شامل عدم ذکر محدوده نارمل، عدم ذکر واحد های مشخص محدوده نارمل و ذکر محدوده نارمل به شکل اشتباه) بودند. در حدود 36 فیصد فورم نتایج فاقد آدرس مشخص لابراتوار مربوطه، 54 فیصد فاقد مشخصات مریض (به شمول نام، تخلص، سن، جنس، تاریخ مراجعه، تشخیص احتمالی)، 48 فیصد فاقد مشخصه نام داکتر (به شمول رشته اختصاصی، نام و آدرس مشخص) و 10 فیصد فاقد درج تاریخ اجرای آزمایشات انجام شده بودند (شکل 1). مشکلات در تحریر نام آزمایش ها و در محدوده نارمل هم خیلی زیاد بوده که در بعضی موارد یا از محدوده نارمل هیچ تذکر بعمل نیامده است و یا اینکه محدوده نارمل نظر به ریفرنس های معتبر (7) غلط تحریر شده است. یکی از فورم های نتایج لابراتواری که هویت آن مخفی می باشد در شکل 2 ارائه شده است.

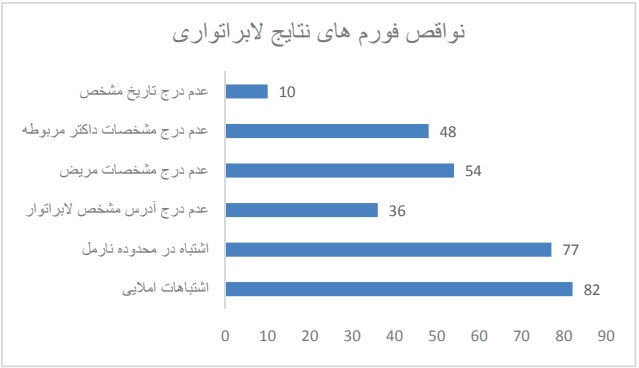
یک نمونه از فورم نتایج لابراتواری را که دارای اشتباهات املایی در نام آزمایش ها و اشتباهات در محدوده نارمل می باشد در شکل 2 مشاهده نمایید.

مناقشه

این مطالعه اولین بررسی است که در مورد فورم نتایج لابراتواری در بعضی از تسهیلات صحی خصوصی و دولتی شهر کابل و غزنی انجام شده است. نتایج بدست آمده نشان میدهد یک تعداد زیاد فورم نتایج لابراتواری هم در سکتور عامه و هم در سکتور خصوصی به شکل غیر استاندرد ترتیب و چاپ شده و اشتباهات بیش از حد در تحریر نام آزمایش ها، تحریر واحد ها و محدوده نارمل در فورم نتایج لابراتواری و عدم درج مشخصات مربوط به مریض، داکتر و لابراتوار در اکثریت فورم های نتایج لابراتواری در تسهیلات عامه و خصوصی موجود می باشد. از طرف دیگر موجودیت نواقص در این فورم و راپور دهی نادرست نتایج لابراتواری، مشکلات عمده صحی را در قبال خواهد داشت. عدم موجودیت هماهنگی در تهیه و چاپ فورم نتایج لابراتواری بیانگر عدم توجه اشخاص و مراجع ذیربط در این مورد نیز بوده می تواند. ایجاب میکند که این فورم های توسط ارگان های ذیربط به صورت دقیق کنترول گردد. یکی از مواردی که برای بهبود سیستم راپوردهی استاندرد لابراتواری مناسب است، عبارت از تطبیق طرزالعمل های خوب لابراتواری یا GLP می باشد که تضمین می نماید تا آزمایش های لابراتواری به صورت مناسب اجرا، ثبت و راپور داده شود (8).

یکی از مزیت های این بررسی این است، که تا حال چنین بررسی در مورد فورمه های نتایج لابراتواری در افغانستان انجام نشده بود، از طرف دیگر در این بررسی فورم های نتایج از تسهیلات صحی خصوصی و همچنان دولتی جمع آوری گردیده است که نمایندگی از هر دو بخش نموده می تواند. از آنجاییکه تعداد لابراتوار های تشخیصیه و تسهیلات صحی درکابل نسبت به سایر ولایات افغانستان زیادتر می باشد، و از طرف دیگر عدم امکانات چاپ راپور های لابراتوار به صورت استاندرد و کمبود اشخاص مسلکی در اکثر ولایات بیانگر این خواهد بود که مشکلات در راپور های لابراتواری سایر ولایات حتی بیشتر بوده که خود ایجاب تحقیق و توجه بیشتر به این موضوع را می نماید.

شکل 1. اشتباهات دریافت شده در فورم های نتایج لابراتواری به فیصدی.



نتیجه گیری

از نتایج این بررسی چنین استنباط می گردد که اکثریت فورم های نتایج لابراتواری شامل اشتباهات در تحریر آزمایش ها، محدوده نارمل، معلومات اندک در قسمت مشخصات مریض، داکتر مربوطه و لابراتوار مربوطه می باشد، از طرف دیگر در تحریر نتایج نیز دقت لازمه صورت نگرفته که ایجاب یک بررسی دیگر را می نماید.

برای حصول اطمینان از معیاری بودن فورم نتایج لابراتواری و راپور دهی دقیق، عملی ساختن اقدامات مؤثر اصلاحی یک امر لازمی شمرده میشود. اقدامات لازم برای بهتر ساختن و معیاری ساختن فورم نتایج و راپوردهی قابل اطمینان قرار ذیل پیشنهاد میگردد:

۱- تدویر برنامه های آموزشی داخل خدمت برای تکنالوجست های طبی.

۲- اتخاذ تدابیرلازم اصلاحی توسط ارگان های مسؤل، در زمینه چاپ فورم نتایج لابراتواری و راپوردهی به شکل استاندرد.

۳- جلب توجه دوکتوران، بیولوژیست ها، تکنالوجست ها، مسؤلین و ارگان های ذیربط در قسمت اهمیت این موضوع.

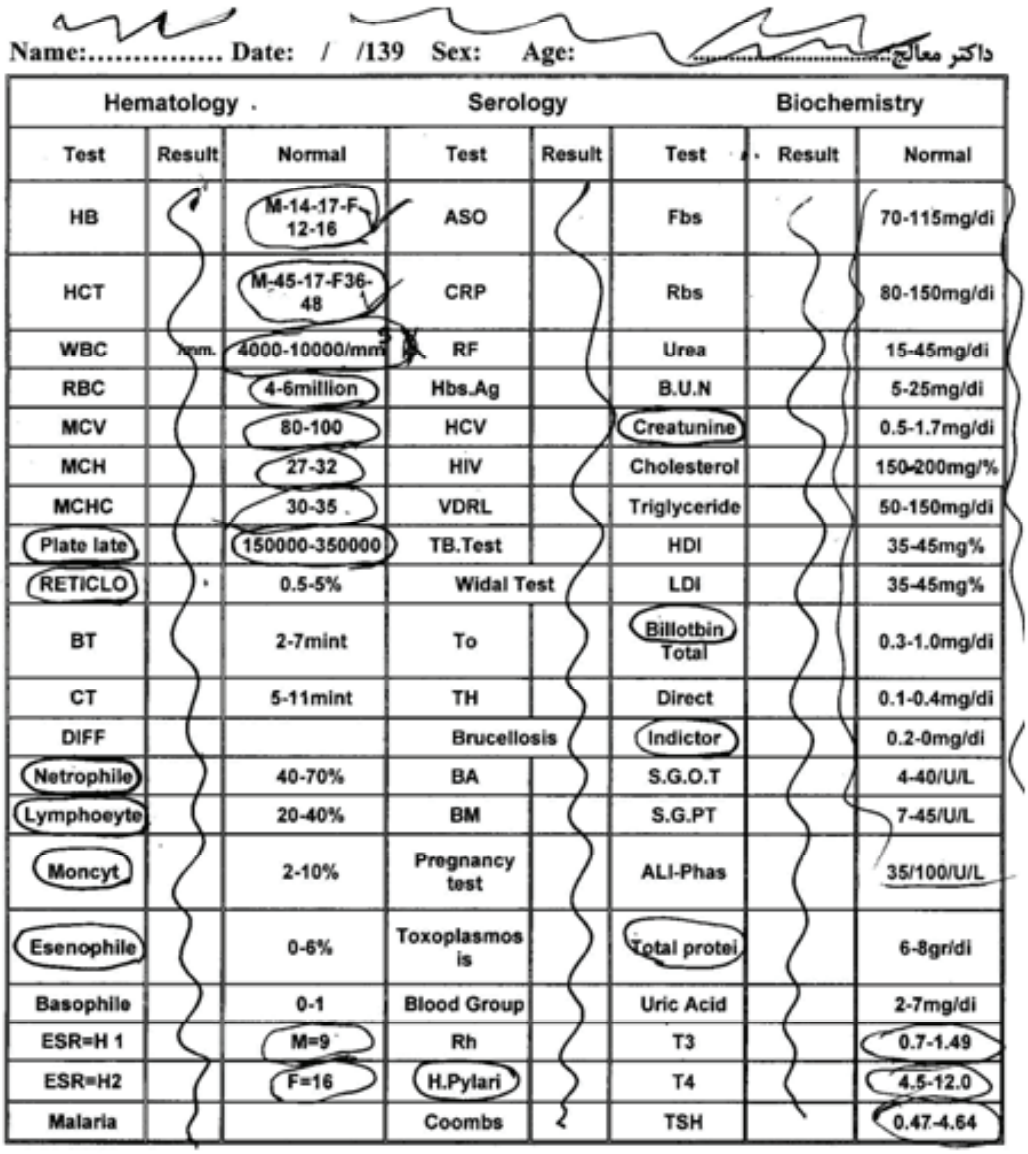
۴- تهیه رهنمود های انجام آزمایش های لابراتواری و راپوردهی نتایج به شکل معیاری.

۶- ایجاد برنامه های سرویلانس در روند اجرای آزمایشات از زمان ثبت و راجستر شدن مریضان الی گذارش نتایج آزمایشات، در مراکز صحی.

۷- جواز دهی مسلکی و همچنان نظارت و بررسی منظم و متواتر از تمام تسهیلات صحی، فراهم آوری کمک های تخنیکی و آموزش در جریان وظیفه برای تمام پرسونل کارکن در لابراتواری های کلینیکی، از طرف وزارت صحت عامه افغانستان ضرورت میباشد.

اظهار سپاس

جا دارد که از تمام مسؤلین لابراتوار های دولتی و شخصی که با ما در جمع آوری فورم نتایج لابراتواری همکاری نمودند و فورم های نتایج سفید را در اختیار ما گذاشتند اظهار سپاس نماییم.



Name:..... Date: / /139 Sex: Age: ..... داکتر معالج

Hematology			Serology		Biochemistry		
Test	Result	Normal	Test	Result	Test	Result	Normal
HB		M-14-17-F-12-16	ASO		Fbs		70-115mg/di
HCT		M-45-17-F36-48	CRP		Rbs		80-150mg/di
WBC		4000-10000/mm	RF		Urea		15-45mg/di
RBC		4-6million	Hbs.Ag		B.U.N		5-25mg/di
MCV		80-100	HCV		Creatunine		0.5-1.7mg/di
MCH		27-32	HIV		Cholesterol		150-200mg/%
MCHC		30-35	VDRL		Triglyceride		50-150mg/di
Plate late		150000-350000	TB.Test		HDI		35-45mg%
RETICLO		0.5-5%	Widal Test		LDI		35-45mg%
BT		2-7mint	To		Billotbin Total		0.3-1.0mg/di
CT		5-11mint	TH		Direct		0.1-0.4mg/di
DIFF			Brucellosis		Indictor		0.2-0mg/di
Netrophile		40-70%	BA		S.G.O.T		4-40/U/L
Lymphoeyte		20-40%	BM		S.G.PT		7-45/U/L
Moncyt		2-10%	Pregnancy test		ALI-Phas		35/100/U/L
Esenophile		0-6%	Toxoplasmosis		Total protei		6-8gr/di
Basophile		0-1	Blood Group		Uric Acid		2-7mg/di
ESR=H 1		M=9	Rh		T3		0.7-1.49
ESR=H2		F=16	H.Pylari		T4		4.5-12.0
Malaria			Coombs		TSH		0.47-4.64

شکل 2. تصویری از فورم نتایج لابراتواری که در آن اشتباهات زیاد در نام آزمایش ها و تحریر محدوده نارمل موجود می باشد.

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"پروفیسـور غضـنفر"