Today the state of global health has improved a lot as compared to the past because of eradication and elimination of some of the important infectious diseases like smallpox and polio, and good control over many others. But on the other hand emergence of new hitherto unknown life threatening infectious diseases for which most of world population is vulnerable are posing a new challenge to global health care system.

Among recent emerging disease important ones are AIDS, SARS, H1N1 and Ebola virus infections and recently in summer of 2012 in Jeddah, Saudi Arabia, a new strain of the coronavirus was isolated by Dr Ali Mohammed Zaki from the lungs of 60 year old male patient with acute pneumonia and acute renal failure. In September 2012 the same type of virus was isolated in England from a patient with severe respiratory illness, who was transferred from Qatar to England and had a history of visit to Saudi Arabia. This new species of the virus was referred to as colloquially as “Saudi SARS” or “SARS like virus”.

PROBLEM STATEMENT

As on 16th May 2014, according to European centre for disease prevention and control, 621 cases and 188 deaths have been reported to WHO from 19 countries from different regions. (Table 1).

Between March 2013 and March 2014 the monthly average number of reported cases was 15. But number of reported cases increased markedly in April 2014 with 217 cases and 38 deaths it may be due to recent change in the screening protocol as testing of patients presenting with milder symptoms and change of sensitivity in laboratory methods.

EPIDEMIOLOGICAL DETERMINANTS

AGENT

It is a positive sense, single stranded RNA virus belonging to genus Betacorona virus. It was later named as Middle East Respiratory Syndrome Corona virus (MERS-CoV particles as seen by negative stain electron microscopy. Virions contain characteristic club-like projections emanating from the viral membrane. Image source: Cynthia Goldsmith/Maureen Metcalfe/Azaibi Tamin, Public Domain Photo from http://www.cdc.gov/corona-virus/mers/photos.html )

Table 1: Cases and deaths reported by WHO from 19 countries from different regions.

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<th>Regions</th>
<th>Countries</th>
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<th>Deaths</th>
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</tr>
<tr>
<td>Total</td>
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</tr>
</tbody>
</table>

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(MERS-CoV). It is the sixth and latest in the list of corona viruses infecting humans. It is known to affect respiratory tract, gastrointestinal tract and to cause acute renal failure.

HOST FACTORS:
Patients more vulnerable to infection and complications are:
1. Chronic diseases such as Diabetes Mellitus, Heart disorders
2. Organ transplant recipients on immunosuppressive therapy
3. Patients with weak immune system such as cancer on treatment

From the cases so far identified, males are more commonly affected than females with male to female ratio of 1.7:1. Average age of persons affected was 48.5 years. Out of the 543 cases for whom age and sex is known, 245 (45%) have been males aged 40 years and above.

ENVIRONMENTAL FACTORS
Environmental factors are not yet clearly defined and epidemiological studies are still underway.

SOURCE OF INFECTION AND MODE OF TRANSMISSION
MERS-CoV is likely to have originated from Egyptian tomb bat which are transmitted to camels. Young camels are suspected to be the primary source of infection for human beings. It is not certain whether the infections are the result of a single zoonotic event with subsequent human-human transmission or if multiple geographic sites of infection represent multiple zoonotic events from an unknown source. Person to person transmission has been reported but it is not a well sustained transmission. Investigations to identify exact source of infection and routes of transmission are still ongoing. The increased number of cases reported could be a result of more effective human-to-human transmission, even if the main source of infection is still zoonotic. Transmission could potentially occur via respiratory or faecal shedding, or other types of contact.

INCUBATION PERIOD
Estimated to be 2 to 14 days from cases so for identified.

CLINICAL FEATURES
Not all infected people develop symptoms. Coughing, mucous, shortness of breath, malaise, chest pain, fever, diarrhoea is seen in many cases and renal failure in some cases. Infection with MERS-CoV is described as flu like illness with signs and symptoms of pneumonia. Case fatality rate is about 30% from available information. Complications are severe pneumonia and renal failure.

SARSCoV is more human transmissible than MERS-CoV, but MERS-CoV is more deadly. The case fatality rate of MERS-CoV is 30% whereas that of SARSCoV is 10%.

LABORATORY DIAGNOSIS
SPECIMEN COLLECTION
Available evidence suggests that lower respiratory tract specimens contain higher virus titers than upper respiratory tract specimens and are more sensitive for detecting the presence of the virus. Lower respiratory tract specimens include:
- Sputum, induced or non-induced.
- Endotracheal aspirate for patients on mechanical ventilation.
- Bronchial alveolar lavage for those in whom it is indicated for patient management.

COLLECT blood for serological testing. For recent cases, an initial blood specimen should be collected and a repeat specimen taken after a period of at least 3 weeks. For cases that had symptom onset more than 3 weeks prior to being investigated, a single blood sample is sufficient.

MERS-CoV has been identified in other body fluids including blood, urine, and stool of infected patients. However, titers of virus in these body fluids are quite low and they may not be useful for diagnostic testing.

MOLECULAR DIAGNOSTICS
PCR is the most widely used method for detecting the presence of the virus. At least three sites in the virus genome have been identified. A confirmed case should either have positive test results for at least two different sites in the virus genome, or a positive result for a single site plus sequencing of a different, appropriate site that shows close similarity to known sequences of the virus.

MANAGEMENT
No specific treatment is yet available; patient should be put on supportive medical care to relieve symptoms. Convalescent plasma, intravenous immunoglobulin, interferon, HIV protease inhibitors, ribavirin, corticosteroids, nitazoxanide and combination therapy are being tried. Apart from convalescent plasma, which is hardly available, the evidence for any other treatment is minimal. And No vaccine is available.

PREVENTION AND CONTROL
CONTROL OF RESERVOIR
- Creating awareness among public and health care professionals regarding the merscov infection.
- As camels are the likely source of infection to humans, camels should be under strict vigilance.
- Early diagnosis and management of cases.
- Isolation suspected cases in hospitals.
- Prompt disinfection of all infectious materials suspected to contain virus.
- Maintaining strict surveillance according to WHO guidelines.

BREAKING CHAIN OF TRANSMISSION
Virus is known to spread by direct and indirect mode, hence standard precautions with droplet precautions should be followed specially in clinics and hospitals.

PROTECTION OF SUSCEPTIBLE HOST
As no vaccine or drug is available for specific protection, avoidance of infection is the only feasible measure.

ADVICE BY WHO
- It is not always possible to identify patients with MERSCoV early because some have mild or unusual symptoms, hence standard precautions should be applied consistently for all patients irrespective of their diagnosis.
- Droplet precautions should be added to standard precautions while providing care to patients with symptoms of respiratory infection 
- Contact precautions and eye precautions should be added while caring for possible or confirmed cases 
- Airborne precautions should be applied when performing aerosol generating procedures 
- Patients should be managed as potentially infectious when clinical and epidemiological clues strongly suggest MERSCoV, even if an initial test on a nasopharyngeal swab negative. Repeat testing should be done if initial test is negative preferably specimen from lower respiratory tract. 
- Recent travellers returning from the Middle East who develop severe respiratory infection should be tested for MERSCoV. 
- Prompt notification of case to WHO along with information about potential exposure. Investigation into the source of exposure should be initiated. 
- At risk people should avoid close contact with animals when visiting farms or barn areas where the virus is known to be potentially circulating
- For general public when visiting farm or barn general hygiene measures should be undertaken 
- WHO does not advise special screening at points of entry with regard to this event nor does it currently recommend the application of any travel or trade restrictions.

WHO ADVICE TO TRAVELERS TO THE MIDDLE EAST
- Should avoid contacts with animals and their waste products
- Should limit contacts with others and practice cough etiquette (maintain distance, cover coughs and sneezes with disposable tissues or clothing, and wash hands) if they develop respiratory illness
- Should avoid close contact with sick people, especially with those suffering from acute respiratory infections
- Should practice good hand hygiene, especially if respiratory symptoms develop and after direct contact with ill people or their environments.
- General travel health advice, including avoiding unsafe water, undercooked meats, and raw fruits and vegetables unless freshly peeled and washed.

REFERENCES
6. WHO guidelines for investigations of cases of human infection with Middle East Respiratory Syndrome Coronavirus (MERS-CoV) July 2013.