Ebola preparedness in Germany - Competence focused in specialized laboratories and Treatment Centers

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The Ebola Epidemic in West Africa
IOM – Forum on Microbial Threats
Washington, D.C., March 25, 2015
SARS, MERS-Corona virus, Ebola virus

- Threat posed by new/re-emerging, highly contagious, and dangerous infectious agents is real.
- Need to be prepared to handle challenge in a reliable and safe fashion.
- Concept for management and control developed by Competence and Treatment Centers and RKI.
- Special expertise established.
Preparations in place

- Safe care for patients
- Diagnostic systems available
- Contact tracing established
- Isolation of contacts established
Risk of acquiring Ebola virus disease in Germany

Basic assumptions:

– There is a risk of importing EVD from West Africa, but very low
– Spread of EVD in Germany virtually excluded, due to efficient existing structures
– No risk for general population
– Helpful in managing EVD risks:
  • direct contact with patients/body fluids required for infection
  • only symptomatic patients are infectious
Ebolavirus outbreak: Support and preparedness in Germany

- Outbreak in West-Africa: Help locally
- Imported infections via travellers
- Medical evacuation of infected health care workers to German hospitals for treatment
Ebola Virus – Preparedness in Germany

Measures for a probable EVD case

- Personal protection
- Isolation
- Primary care
- Contact person
- Disinfection
- Lab diagnostics
- Patient transport
- Waste / Waste water

Who supports clinicians? Who coordinates measures?
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Great insecurity also among the professional public due to lacking experience
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Framework Ebola Virus Disease – Preparation measures

Recognize – Assess - Manage

- Pathogen characteristics and clinical picture
- Detection of a probable case
- Infection control measures
- Laboratory diagnostics
- Clinical management
Framework Ebola Virus Disease
RKI recommendations on intervention preparedness

– Suspected cases: define, detect, provide care
– Diagnostics
– Handling of contact persons
– Patient transport
– Isolation and treatment of cases
– Therapeutic approaches
– Post exposition measures
– Disinfection, decontamination, handling of waste/waste water
– Communication
Concept of competence and treatment centers

Hospital with initial care
- Airport, local hospital etc.

Diagnostics (incl. sample shipment)
- 1 diagnostic lab BSL 4
- 1 confirmation lab BSL 4

Patient transport

Treatment and isolation
- Treatment Centers (7)
  - Hamburg
  - Frankfurt/M.
  - Leipzig
  - Stuttgart

Management
- Competence Centers
  - Public Health Service
  - Infectiology / Hospital
  - Hospital hygiene / Decontamination
  - Ambulance
  - Communication

Treatment and isolation
  - Management

Berlin
- Düsseldorf
- München
STAKOB coordinated by RKI

- “Network of Competence and Treatment Centers” for dangerous and highly contagious infections
- About 50 beds available
- Sufficiently trained personnel ??
- Special isolation units (airlocks, decontamination, low pressure rooms, air filtration, protective suits etc.)
- Regular training! About once a month
- Dedicated personnel (physicians, nurses, technicians)
- Specialized transport
STAKOB -
Ständiger Arbeitskreis Kompetenz- und Behandlungszentren

(für hochkontagiöse und Lebensbedrohliche Erkrankungen)
Network of Centers (STAKOB)

Linking of:

– Public Health Service
– Clinical care
– Specialized lab diagnostics
– Ambulance service
– Hospital hygiene
– Comparable standards

Quick and professional reaction, also in critical situations
Members of Competence Centers

- Public health officials
- Clinicians specialized in infectious diseases and intensive medicine
- Ambulance services / fire fighters
- Police
- County officials
- Medical microbiology / hygiene
- Occupational medicine
- Foreign Office? Armed Forces?
STAKOB centers interaction

- Exchange on therapeutic options / experience
- Standardized procedures
- Support with personnel / equipment
- Agreement in the case of medical evacuation
- Standards for release of patients and precautions
- Coordination of experimental therapy
Support of health officials and clinicians in Federal States:

- Advice on clinical differential diagnoses, proper anamnesis and lab diagnostics (by phone or on-site)
- Sample and patient transport
- Management of contacts (identification, risk evaluation, observation, PEP, patient advice)
- Risk communication
- Decontamination / waste management
- Security recommendations, press release
Treatment Center: Prerequisites

- Experience with barrier nursing
- Only on voluntary basis
- Airlock, ante room, and patient room
- Low pressure (1 x/2 x), air filtration
- Protective suit with respirator
- Routine clinical chemistry
- Intensive care equipment
- Access restrictions
- „Normal“ use in between crises (e.g. MDR-Tb); economic aspects
Experience in German treatment centers

- Intensive care for one seriously ill Ebola patient: 20 (up to 30) HCW required, including 4-5 physicians
- Working in 3 shifts (maximum 4 hrs)
- Direct costs and major indirect costs (personnel retrieved from other wards, no longer functional)
Experience with suspected cases

So far: professional response:

- Rapid reaction
- Rapid diagnostics to exclude EVD
Importance of permanent training!

Special Isolation Unit Berlin
- Largest one in Germany
- Adjacent to RKI
- 20 beds
- Needed: 200 trained HCW!
- Permanent training: Medical
  Technical
  Logistical

Fluctuation of personnel!
- Storage of sufficient material
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When is a suspicion of a case of EVD well founded?

Criteria for probable case

Anamnestic history:

- Clinical picture?
- Travel history?
- Contact history?

Differential diagnosis: Malaria tropica
Flowchart for medical doctors in Germany aiding in the recognition of probable cases of Ebola virus disease (EVD) (German case definition) EVD outbreak, West Africa, update October 23, 2014

* The listed occupational safety measures are recommended by the Committee for Biological Agents (ABAS) of the Federal Institute for Occupational Safety and Health (BAuA). Instructions for donning and doffing of protective equipment: www.rki.de/schutzkleidung. Instructions for disinfection: www.rki.de/ebola-desinfektion. These documents are only available in German.

** Contact:**
- Direct contact with blood or other body fluids (including virus-containing tissue) of confirmed or deceased or probable EVD patients, as well as possible contact with Ebola virus-contaminated clothing/objects
- Unprotected contact (distance of < 1 m) with confirmed or deceased or probable EVD patient, including household contacts, flight passengers (1 seat in all directions and across the aisle) and flight crew members attending the patient
- Visit to an African hospital treating EVD patients

No contact: Presence (distance of > 1 m from a patient) in the same room/transportation vehicle

° Countries currently affected by Ebola virus outbreaks are: Guinea, Liberia, Sierra Leone, Dem. Rep. Congo (Province Équateur). A list of countries is available under: www.rki.de/ebolagebiete (in German).

→ For further questions, professional staff can contact public health services (local health authority [Gesundheitsamt], and Kompetenz- or Behandlungszentrum: www.stakob.rki.de).

→ For suspected cases with compatible clinical symptoms, for whom it is not possible to evaluate personal contacts and travel history, protective measures described for the anamnesis of suspected EVD patients are recommended. These are also advisable if the suspected case is transferred to a hospital. A spatial separation of the patient is recommended, which does not require an isolation unit. The initial diagnostics and routine checks should be done under standard conditions. If a probable case cannot be ruled out, diagnostics for the detection of Ebola virus should be initiated.
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Measures for justified suspect case of Ebola virus

Personal protection

Risk assessment and selection of suitable PPE!

- Respiratory protection (FFP3 half mask)
- Eye and face protection (protective goggles and face shield)
- Gloves (two pairs of gloves)
- Body protection (disposable suits or gown with apron and hood)
- Foot protection (Disposable over boots or rubber boots)

Is PPE available and can it be donned adequately?
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Measures for justified suspect case of Ebola virus

Personal protection
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Measures for justified suspect case of Ebola virus

Isolation

Adequate Institution

– Goal: Transfer to Special Isolation Unit for further diagnostics

– Principal infrastructure: 47 beds (36 intensive care)

– Realistic:

After previous experience with EVD patients:

12 intensive care beds

– Up to 16 physicians and 16 nurses / technicians for 1 patient)
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Measures for justified suspected case of Ebola virus disease

Laboratory diagnostics

Detection of Ebola Virus

- Primary orientation diagnostics in appropriate BSL 3 / BSL 4 Lab
- Routine and differential laboratory diagnostics: as PoC diagnostics
- Only as an exception: Local collection of blood samples with PPE

P620
UN 2814
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Measures for justified suspect case of Ebola virus

- Release of contact persons:
  only after agreement with local health authority

- Documentation of contacts and classification of exposure risk

- Monitoring of symptoms for 21 days (local health authority)
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Doffing of PPE

Before PPE doffing: PPE disinfection is necessary!

For confirmed cases:

- Full body decontamination
- Doffing of protective clothing and decontamination with help of second person (buddy system!)

*Only correct donning and doffing of PPE guarantees protection*
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Health care workers returning from outbreak area

Personnel involved in patient care under appropriate personal protection is NOT principally suspected to be infectious (§7 IfSG).

**Recommendation:**
Monitoring for 21 days

If symptoms: Isolation, contact health authority
Medical evacuations and repatriations from EVD-affected countries, ECDC situation update, as of Oct. 24, 2014

*Numbers displayed over the connection lines are referring to number of medical evacuations.*
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Evacuation for medical reasons using the “Robert Koch”

Protection concept of the special isolation unit:

- Outer and inner locks, patient area
- Hermetically sealed rooms with low pressure and pressurization
- Waste management and final disinfection procedures
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Medical technical equipment (excerpt):

- Monitoring screen
- Respirator
- I.V. pumps for intravenous medication
- Perfusors for intravenous medication
- Ultrasonic device
- Blood-gas analysis
- Drugs specifically intended for the treatment of EVD patients
“Splendor and misery” of a Federal System

- Responsibilities split between federal institutions and federal states, down to county level
- Requires complex interaction
- Particularly in the case of zoonoses (also veterinary services)
- Challenge: coordination of available capacity, competence, resources, goal-oriented, synergies
- Professional risk and crisis communication:
  By whom? To whom?
- Public health service: frequently rudimentary staff, rapid reaction and surge capacity?
Responsibilities in a federal system

- Responsible to act locally: each federal state!
- NOT federal institutions like RKI!
- Intensive and rapid exchange (also informal)
- RKI: Only ADVICE for prevention, detection and avoidance of spread of infection
- RKI does not ORDER! No mandate for local action
- Important role: local health authorities (approx. 400 counties nationwide)
Importance of functioning public health system

- Efficient reporting of notifiable infections
- Centre for Biological Threats and Special Pathogens at RKI
- Training by RKI in how to manage biological risks
- Crisis management exercises: LÜKEX, involving major federal institutions (including security agencies) and federal states (fictional, but realistic)
- 24/7 Emergency contact available at
  - Bernhard Nocht Institute for Tropical Medicine, Hamburg,
  - Institute of Virology, Marburg, and
  - RKI
Information / Communication by RKI

Detailed information for

- Medical and Public Health institutions and health care workers = professional public
- General population

Primarily via Internet, e.g. FAQ, specific recommendations

Updates
(a) Journal provided to all German physicians (*Deut. Ärzteblatt*)
(b) *Epidemiological Bulletin* of the RKI (weekly)
What can a national public health institute contribute to counteract the current Ebola outbreak?

**Domestic:**

- Risk assessments
- Counselling of decision makers
- Risk and crisis communication
- Technical advice and support
- Diagnostic services
- Interventional epidemiology in transmission incidents
What can a national public health institute contribute to counteract the current Ebola outbreak?

International:

- Advice
  - on the administrative level
  - on the spot (lab and epidemiology)
- Technology and knowledge transfer
- Capacity building
- Diagnostic services
- Interventional epidemiology support
What can a national public health institute NOT contribute to counteract the current Ebola outbreak?

- Operate treatment centers
- Provide logistics
- Allocate financial resources
- Social mobilization
- Decide on the implementation of public health measures
EVD activities by RKI

- www.rki.de
- http://www.rki.de/EN/Content/Prevention/Ebola_virus_disease/Framework_EVD.html