FELLOWSHIP REPORT

Summary of work activities

Dorothee Lohr
Intervention Epidemiology path (EPIET)
Cohort 2014

Background

The ECDC Fellowship Training Programme includes two distinct curricular pathways: Intervention Epidemiology Training (EPIET) and Public Health Microbiology Training (EUPHEM). After the two-year training EPIET and EUPHEM graduates are considered experts in applying epidemiological or microbiological methods to provide evidence to guide public health interventions for communicable disease prevention and control.

Both curriculum paths are part of the ECDC fellowship programme that provides competency based training and practical experience using the 'learning by doing' approach in acknowledged training sites across the European Union (EU) and European Economic Area (EEA) Member States.

Intervention Epidemiology path (EPIET)

Field epidemiology aims to apply epidemiologic methods in day to day public health field conditions in order to generate new knowledge and scientific evidence for public health decision making. The context is often complex and difficult to control, which challenges study design and interpretation of study results. However, often in Public Health we lack the opportunity to perform controlled trials and we are faced with the need to design observational studies as best as we can. Field epidemiologists use epidemiology as a tool to design, evaluate or improve interventions to protect the health of a population.

The European Programme for Intervention Epidemiology Training (EPIET) was created in 1995. Its purpose is to create a network of highly trained field epidemiologists in the European Union, thereby strengthening the public health epidemiology workforce at Member State and EU/EEA level. Current EPIET alumni are providing expertise in response activities and strengthening capacity for communicable disease surveillance and control inside and beyond the EU. In 2006 EPIET was integrated into the core activities of ECDC.

The objectives of the ECDC Fellowship - EPIET path are:

- To strengthen the surveillance of infectious diseases and other public health issues in Member States and at EU level;
- To develop response capacity for effective field investigation and control at national and community level to meet public health threats;

The views expressed in this publication do not necessarily reflect the views of the European Centre for Disease Prevention and Control (ECDC).

This portfolio does not represent a diploma. Fellows receive a certificate acknowledging the 2-year training and listing the theoretical modules attended. Additionally, if all training objectives have been met, they receive a diploma.

Stockholm, September 2016

- To develop a European network of public health epidemiologists who use standard methods and share common objectives;
- To contribute to the development of the community network for the surveillance and control of communicable diseases.

Fellows develop core competencies in field epidemiology mainly through project or activity work, but also partly through participation in training modules. Outputs are presented in accordance with the EPIET competency domains, as set out in the EPIET scientific guide[1].

Pre-fellowship short biography

Since 2002 Dorothee Lohr has been working as a scientific employee at the State Health Office Baden-Wuerttemberg (LGA). Initially, she worked in the field of hospital and water hygiene but moved to the Department of Epidemiology and Health Monitoring in 2005. Her main tasks include surveillance of notifiable infectious diseases and outbreak reporting.

Fellowship assignment: Intervention Epidemiology path (EPIET)

On 15 September 2014, Dorothee Lohr started her EPIET fellowship at the State Health Office (LGA), Stuttgart, Germany, under the supervision of Dr. Guenter Pfaff. This report summarizes the work performed during the fellowship.

Fellowship portfolio

This portfolio presents a summary of all work activities (unless restricted due to confidentiality regulations) conducted by the fellow during the ECDC Fellowship, EPIET path. These activities include various projects, and theoretical training modules.

Projects included epidemiological contributions to public health event detection and investigation (surveillance and outbreaks); applied epidemiology field research; teaching epidemiology; summarising and communicating scientific evidence and activities with a specific epidemiology focus. The outcomes include publications, presentations, posters, reports and teaching materials prepared by the fellow.

This portfolio also includes a reflection from the fellow on the field epidemiology competencies developed during the 2-year training, a reflection from the supervisor on the added value of engaging in the training of the fellow, as well as a reflection by the programme coordinator on the development of the fellow's competencies.

Fellowship projects

1. Surveillance

Title: Completeness and quality of notifiable disease data reported in Baden-Wuerttemberg in 2014

After an upgrade of the software for reporting infectious diseases was installed in the local health offices (LHO) of Baden-Wuerttemberg, problems of missing variables in reported cases as well as missing or not withdrawn cases were noticed during daily quality checks.

This study aimed to check data quality of reported infectious diseases in Baden-Wuerttemberg with special regard to new possibilities of data input.

Data analysis from 7 out of 8 selected LHOs showed PPV and specificity of 100% for 5/7 LHO and sensitivity of 100% for 6/7 LHO regarding data transfer to LGA. A new feature of case transfer between LHOs was detected.

Non-conformity with case definitions was seen in missing lab-confirmation of Tick Borne Encephalitis (TBE, 6.8%), missing severe clinical symptoms of Clostridium difficile (11.8%) and presence of exclusion criteria of Hepatitis B (26.1%) and C (4.7%).

[1] European Centre for Disease Prevention and Control. European public health training programme. Stockholm: ECDC; 2013. Available from: http://ecdc.europa.eu/en/epiet/Documents/Scientific%20guides/EPIET%20Scientific%20Guide_C2016.pdf

The proportion of incomplete data for exposure was low for non-endemic viral diseases Chikungunya (0%) and Dengue fever (3.6%), and higher for TBE (35.0%), Hantavirus disease (41.9%) and Q fever (50.0%), and 40.0% for measles. Vaccination status was incomplete for TBE (6.7%) and measles (10%). All data sets on 77 EHEC cases were transferred from LHO to LGA without data on serogroup because data input was technically not possible.

Incomplete data were due to omission of data entry in LHOs, resulting from missing knowledge of input features and absence of technical program features for data input. Training was offered to members of LHO in order to improve data transfer and to demonstrate the new input features. The program designer was asked to install new features like statistic programs and EHEC serogroups and to continuously adopt their program according to RKI requirements. Continuous surveillance of data and feedback to program designer, the provider and LHO is necessary to maintain and improve data quality and to reduce time consuming data checks and remediation.

Role and outputs:

As the principal investigator, I wrote the protocol, collected and analysed the data. I contacted the program designer for improvement of the program and organized a training unit for local health officers where I presented two teaching units [26, 27] to improve input of surveillance data [see „teaching "]. I presented the results during "jour fixe" for German FETP at RKI in February 2016 [24].

Supervisor: Guenter Pfaff

Title: Will routine PFGE-genotyping replace questionnaires on food consumption for investigating Listeria monocytogenes cases in Baden-Wuerttemberg, Germany?

To identify sources of infection and prevent further cases, the State Health Office recommends that local health officers interview every notified Listeria monocytogenes (Lm) case in Baden-Wuerttemberg on food consumption using standardized questionnaires. However, the data on exposures often is of poor quality due to the old age and comorbidities of patients, and long incubation periods. Since 2010, Lm isolates have been routinely PFGE-genotyped. This is a prerequisite that PFGE-patterns of Listeria isolates from food items can be compared to those from human cases.

We evaluated how PFGE-typing and food questionnaires contributed to identifying the source of infection. We defined a cluster as two or more isolates with the same PFGE-pattern, and a "linked-food" as a food item with the same PFGE-pattern as cluster cases and consumed by at least two cases in that cluster. We assessed the number and characteristics of PFGE-typed isolates as well as the number of questionnaires received between 2010 and 2015 and linked food items.
Of 432 reported cases, 116 (27%) completed a food questionnaire and 290/432 (67%) had isolates genotyped. 194/290 were grouped into 43 clusters of 2-37 cases (median 2 cases per cluster). To 12/43 (28%) clusters at least two food questionnaires were available; but in only 4/43 clusters, accounting for 17/290 cases, a linked food was identified.
In the past, clusters of Lm infections were only identified by PFGE-genotyping and not through analysis of questionnaires. In order to match apparently isolated cases to clusters, all human Lm isolates should be routinely genotyped. Food questionnaires only helped to explain a small percentage of clusters identified by PFGE, but they might be needed to prioritize food isolates for PFGE, and to match them with PFGE patterns of clusters.

Role and outputs:

In cooperation with Elisabeth Aichinger, I analysed the data for a poster presentation at the Public Health Congress in Reutlingen, Germany 2016 [5] and for ESCAIDE 2016 [8].

Supervisors: Elisabeth Aichinger, Guenter Pfaff

Competencies developed:

I learned sampling strategies, calculation of PPV, specificity and sensitivity as well as comparison of different data sources. Furthermore I improved my knowledge in the organization and coordination of training modules with different presenters, communication between different target groups, logistics and management of teaching.

I learned managing and analysing bigger data sets and interpreting laboratory results of listeria typing methods.

2. Outbreak investigations

Title: Increase of Listeria PFGE-pattern 13a/54 in Southwest Germany – finding the possible source of a prolonged outbreak from 2012 to 2016

In June 2015, three cases with an identical PFGE pattern *13a/54* were detected within four weeks reporting time. This PFGE pattern belonging to serogroup 2a had been observed 30 times in Baden-Wuerttemberg and 20 times in other federal states of Germany. No corresponding food item had been detected by veterinarian and food authorities so far. In cooperation with the Robert Koch Institute (RKI), the Baden-Wuerttemberg State Health Office (LGA) started the outbreak investigation in order to detect possible sources of infection.

We collected data of recent listeria outbreak cases by telephone interviews of patients 2015. We included existing information collected from already interviewed listeria patients from December 2012 to January 2014.

Questionnaires were analyzed on variables such as types of food consumed and food purchased in different grocery stores. Data from a total of 20 questionnaires was included in the analysis received until September 2015. 70% proportion of consumption and purchase was defined as a threshold for further discussion, taking into account reasons of microbiological plausibility of contamination. We generated the hypothesis that meat, especially pork meat and pork meat products are the possible source of infection as 100% of patients reported consumption of such products in our questionnaire. Thus, we recommended prioritizing *L. monocytogenes* isolates from pork and pork meat products for further typing.

In March 2016, *L. monocytogenes* was detected in a lot (batch) of juniper-flavored pork belly drawn at a Bavarian meat and sausage producer. Molecular analysis confirmed the genetic identity with the outbreak strain. As the patient with the most recent disease onset actively reported having consumed this product in the incubation period, RKI reported high epidemiological evidence that the outbreak was caused by products of this producer. This identified the source of the longest and biggest listeria outbreak in Germany with 80 cases in 3.5 years. An official warning was issued and the products were withdrawn from the market.

Role and outputs:

The outbreak investigation was done in cooperation between epidemiologists and veterinarians in Baden-Wuerttemberg, two other federal states of Germany and Robert Koch Institute, which led the investigations. I performed data input of patients interviewed by local health offices, RKI and by myself. I analysed the data and generated the hypothesis. According to this hypothesis, we recommended that veterinarians prioritize the analysis of pork products. Finally, the source of infection was found in a pork product of a Bavarian producer. I personally interviewed the patient with the most recent disease onset in Baden-Wuerttemberg and found an epidemiological link to the contaminated product. The manuscript of the common publication (intermediate status) was written by RKI with me as a co-author. It was published in a peer reviewed journal [1].

I presented the results in a meeting between federal states and RKI [16] and in a FETP telephone conference [22]

Supervisors: Elisabeth Aichinger, Guenter Pfaff

Title: Q-Fever in a hospital setting, Baden-Wuerttemberg 2015

In July 2015, Q fever pneumonia occurred in three patients and one staff of one sheltered accommodation of a psychiatric hospital. About 60% of infections of *C. burnetii* occur without symptoms, but underlying diseases increase the risk of chronic infections. Therefore we used a clinical survey offered to all patients and staff which was initiated for reasons of preventive medical care to conduct a retrospective cohort study in order to detect undiagnosed cases and identify the source of infection.

We defined the cohort as persons living or working in this accommodation between 15th May and 31st July 2015. Serological tests and questionnaires on symptoms, underlying diseases and exposures were offered. Cases were defined as having a positive test for Phase2-IgM-antibodies against *C. burnetii* (Elisa Virion-Serion). We excluded persons with former, chronic or unclear infections. We calculated attack rates (AR). As a sheep herd had grazed

and lambed nearby, veterinarians tested three ewes serologically for antibodies against *C. burnetii* using complement fixation.

79/100 residents and 27 staff responded. 34/106 (32%) participants reported cardiac diseases, diabetes and/or immunosuppression. We identified three symptomatic and three asymptomatic cases in addition to the four initial cases. AR was 11.6% (8/69) for residents and 8.0% (2/25) for staff. The median age for cases was 60.5 years, and 50% were female. An ewe, which had lambed two weeks before the onset of the first human case, was tested positive.

Onset of diseases was compatible with a point source defined by the lambing of the infected ewe, which was followed by weatherly conditions with days of strong winds blowing towards the building.

We recommended expanding the investigation to known risk groups for developing a chronic outcome in the whole hospital complex. To prevent further outbreaks in endemic regions only vaccinated or negatively tested sheep flocks should graze in proximity to hospitals or maternity clinics.

Role and outputs:

I wrote the protocol, developed the questionnaire in cooperation with my colleagues, analysed outbreak data, and presented the results to the members of the hospital [20, 33]. I wrote a manuscript for the annual report of LGA [35]. I presented the results as a poster at the Public Health Congress in Reutlingen, Germany 2016 [4]. I presented the results to the local health authorities in Baden-Wuerttemberg and at a FETP telephone conference [23]. I will present a poster at ESCAIDE 2016 [9]. Manuscript submitted to Epidemiology and Infection, November 2016 [2].

Supervisors: Christiane Wagner-Wiening, Guenter Pfaff

Title: Influenza in a diabetes clinic, Baden-Wuerttemberg 2015

In mid-December 2015, a local health office (LHO) reported an influenza outbreak in a diabetes clinic. The clinic initiated measures for infection control and prevention. We conducted an outbreak investigation in order to give recommendations to the clinic regarding influenza management for future influenza seasons.

We described cases and calculated the frequency of chronic diseases and immunization.

The 33 cases occurred in four out of six wards of the hospital and lasted six days. The primary case was an unvaccinated diabetic patient with onset of disease one day after admission. Overall AR for diabetic patients was 26.2% with higher AR for the two wards where the initial case stayed and was treated due to severe symptoms. AR for staff was 12.0%. Eight cases were lab confirmed for influenza A, typed as A(H1N1)pdm.

Apart from the initial case, symptoms were mild and lasted 1-6 days. Only 18% diabetic patients were vaccinated. Main additional underlying diseases reported by diabetic patients were obesity (54.5%), heart diseases (27.3%) and lung diseases (18.2%).

The outbreak occurred unusually early in the influenza season. Epicurve, incubation time of influenza virus and attribution of cases to different wards indicates that transmission occurred in different steps, starting on the two wards of the initial case and spreading to two other wards of the hospital. No more infections were reported after infection control was started, so the outbreak could be stopped immediately. Vaccination coverage for diabetic patients and staff was low, regarding recommendations of STIKO. Vaccination could have prevented the import and spreading of the virus.

We recommend the hospital to inform and motivate their staff for yearly influenza vaccination. As diabetes is an indication for influenza vaccination according to STIKO recommendations, diabetic patients should be informed accordingly and advised to be vaccinated before their stay in the hospital.

Role and outputs:

As a principal investigator, I analysed outbreak data collected by staff of the hospital. I wrote the report for the diabetes clinic [34]

Supervisors: Christiane Wagner-Wiening, Guenter Pfaff

Competencies developed:

By analysing three different outbreaks of a foodborne disease, a zoonotic and a vaccine preventable disease, I developed and further intensified cooperation with different authorities. I improved my time management and practiced how to present data in different ways to different target groups. I also learned about protecting individuals and handling conflicts of interest.

3. Applied epidemiology research

Title: TIP-Project: Study of factors influencing measles vaccination rates of preschool children

A study among Social Medical Assistants´ experiences and perceptions about parents´ attitudes towards measles vaccination in Baden-Wuerttemberg

WHO recommends two doses of measles containing vaccine for >95% of the population to eliminate measles. In Baden-Wuerttemberg, social medical assistants (SMA) in 44 counties check vaccination records during school entry examination (SEE) and counsel parents on vaccinations. We adopted a "Guide to Tailoring Immunization Programmes (TIP)" in the WHO European Region to identify reasons for incomplete measles vaccination at preschool age in order to recommend specific interventions for different counties.
We designed a questionnaire for SMA on their perceived reasons for vaccination gaps among preschool children. We used an equidistant scale from 0 (never) to 4 (always) points for answers. The questionnaire was distributed and returned during two general meetings for SMA. We calculated frequencies and means. We stratified by counties reporting higher (over 90.2%) and lower (below 87.2%) two-dose measles vaccination coverage in the SEE 2013/14. We tested significance using the Chi^2-test.
Of the 128 participants, 107 SMA returned questionnaires. As indicated by the respondents, main reasons for measles vaccination gaps were: parents' fear of side effects (score of 2.4 out of 4), health damages due to vaccine compounds (2.0/4) and excessive stress on the immune system (1.7/4), followed by measles being regarded as a harmless (1.9/4) and rare (1.6/4) disease. Participants reported paediatricians, GP and anthroposophical kindergartens to have the highest influence on non-vaccination in general. The most significant difference was in the prevalence of SMA who reported vaccination hesitant doctors in their county: 100% SMA of counties with low vaccination coverage in contrast to 87% SMA of counties with high coverage (p=0.026).
To increase measles vaccination coverage in Baden-Wuerttemberg, we recommend informing parents of young children on risks of measles and addressing concerns about vaccination safety. Educational and motivational campaigns aimed at GPs are necessary to increase immunization rates among patients and to achieve higher population immunity for measles.

Role and outputs:

I participated in the kick-off meeting of the TIP project and presented data on Rubella [10.].

As the principal investigator of the study I wrote the protocol and presented the study in the FETP telephone conference [21]. I organized and managed the focus group discussion; I designed the questionnaire for the survey. I presented the study to the target group of the survey [17] and collected and analysed data. I presented the results to the target group of the survey [18]. I also presented them to my EPIET cohort during vaccinology module [19] and to the participants of the initial kick-off meeting [32].

I wrote a manuscript for a peer-reviewed journal [3] and I will present a poster at ESCAIDE 2016 [7].

Supervisors: Elisabeth Aichinger, Guenter Pfaff

Competencies developed:

I was introduced to the process of school entry examination and I learned how to prepare, conduct and protocol focus groups. I learned designing questionnaires and scaling answers as well as applying statistical methods for data analysis. I learned selecting appropriate sampling strategies.

4. Communication

Publications in peer reviewed journals

1 manuscript (co-author) published (1)

Manuscripts submitted to peer reviewed journals (in review process)

Q fever outbreak manuscript submitted to Epidemiology and Infection, November 2016 (2) . Further manuscript will be submitted by December 2016 (3)

Conference presentations

2 poster presentations at Public Health Congress in Reutlingen 2016 (4, 5) and 1 poster in co-authorship (6)

3 posters will be presented at ESCAIDE 2016 (7, 8, 9)

Other presentations

1 oral presentation at the workshop of WHO Tailoring Immunization Programme TIP 2014 in Stuttgart (10)

4 oral presentations at two general meetings of local health offices 2015 and 2016 in Stuttgart (11-14)

1 oral presentation at an internal colloquium at state health office Baden-Wuerttemberg 2015 (15)

1 oral presentation at a meeting of Robert Koch Institute and federal states of Germany in Berlin (16)

2 oral presentations at Meetings of „Kinder- und Jugendärztlicher Dienst" in Stuttgart and Freiburg (17, 18)

1 oral presentation at vaccinology module 2016 (19)

1 oral presentation at a psychiatric hospital in Rottweil (20)

4 oral presentations during telephone conferences of German FETP (21-24)

1 oral presentation in French in a meeting with a delegation from Morocco and RKI (25)

6 oral presentations for teaching activities (26-31)

1 oral presentation in a telephone conference of WHO for the TIP project (32)

Reports

2 outbreak reports (33, 34)

Other

1 report for the Annual Report 2015 of the State Health Office Baden-Wuerttemberg (35)

5. Teaching activities

Title: Quality management of surveillance, input and data transfer of infectious diseases

I designed and organized a training unit of one day at LGA on 22 January 2015. I coordinated the program with the different presenters as colleagues from LGA and the program designer. Target audience were local public health officers. I presented two teaching units [26, 27] of 30 minutes, each including discussion. The aim was to improve completeness and accuracy of surveillance data according to the health protection act.

Supervisor: Guenter Pfaff

Title: Training for hygiene inspectors

Training courses for of hygiene inspectors are routinely offered by LGA. Courses include one week in epidemiology and infectious diseases as a workshop. I was engaged in two weeks of training: 30.11. – 04.12.2015 and 15.02. – 19.02.2016.

I developed two presentations of one hour, each including discussion [28, 29] and adapted two presentations of colleagues for presentation [30, 31].

I was engaged in case studies of outbreak investigations.

Supervisor: Guenter Pfaff

Educational outcome:

I learned to handle a whole week of teaching at the same time as my routine working surveillance and reporting of infectious diseases. I also improved evaluation of teaching units.

6. Other activities

1. Weekly participation in telephone conferences with Robert Koch Institute and federal states of Germany
2. Weekly participation in telephone conferences with German FETP (PAE telephone conference)
3. Weekly reports of infectious diseases in Baden-Wuerttemberg, Germany
4. ESCAIDE conference 05. – 07.11.2014, Stockholm, Sweden
5. Laboratory module, 23. – 27.02.2015, Berlin and Wernigerode, Germany
6. Workshop:" Meningococci and Haemophilus influenza", 12.06.2015, National reference laboratory Wuerzburg, Germany
7. "National Vaccination Conference", 18. - 19.06.2015, Berlin, Germany
8. Training at a local health office, 19. – 23.10.2015, Böblingen, Germany
9. ESCAIDE conference in Stockholm, 11. – 13.11.2015, Stockholm, Sweden
10. Participation in three workshops at LGA: Asylum and Health on 22.10.2015, 17.12.2015 and 22.03.2016
11. Jour fixe at RKI on 26. – 27.02.2016 and presentation of the project: Completeness and quality of notifiable disease data reported in Baden-Württemberg (BW) in 2014 (24)
12. Meeting for the European Immunization Week on 01.03.2016 at LGA Stuttgart, Germany
13. Public Health Congress in Reutlingen, 28. - 30.04.2016 and presentation of two posters (4, 5)

7. EPIET/EUPHEM modules attended

1. Introductory Course, 29.09. – 17.10.2014, Spetses, Greece
2. Outbreak Module, 08.12. – 12.12 2014, Berlin, Germany
3. Multivariable Analysis Module 23. – 27. 03.2015, Vienna, Austria
4. Project Review Module 24. – 28.08.2015, Lisbon, Portugal
5. Time series Analysis Module, 23. – 27.11.2015, Bilthoven, Netherlands
6. Vaccinology Module 16. – 20.05.2016, Paris, France
7. Rapid Assessment and Survey methods Module, 20. – 25.06.2016, Athens, Greece
8. Project Review Module 22. – 26.08.2016, Lisbon, Portugal

Supervisor's conclusions

Dorothee Lohr has successfully managed to combine fellowship requirements with routine work. As was anticipated, assignments inherent to EPIET programme objectives have expanded the width of Dorothee's involvement in departmental activities beyond her previous focus on surveillance of notifiable infectious diseases and outbreak reporting. Provision of advice and guidance to partners in local public health offices will continue to be part of her portfolio – but at a more in-depth level, and outbreak investigations will be added as opportunities and emergencies arise. Presentations at official meetings with local public health offices and at events for continuing education have already provided opportunities to convey contents from the EPIET programme to the local level, and will continue to do so. In an on-going process, results from the Q-fever study have the prospect to contribute to a change in public policy towards an one-health approach; a cabinet paper being drafted. Observations derived from the TIP-Project study will be discussed with stakeholders at the local, state and federal level, and WHO EURO to develop interventions for the improvement of immunization status against measles, rubella and other vaccine preventable diseases; the preparations for a workshop being under way.

At the end to the supervison period, I am very grateful to Dorothee for taking up the challenge to participate in the EPIET MS Track programme, and to ECDC for admitting her to this cohort. My strong support for the EPIET MS Track approach is well documented, and is backed by this most recent experience with Dorothee's fellowship.

Coordinator's conclusions

Dorothee has made good progress throughout her fellowship, despite competing demands from routine work. She has obtained good learning and project development from public health problems arising from this routine work, in addition to more proactive research into immunisation uptake. Her competency profile shows most improvement in the area of epidemiological studies, reflecting her work on the Q fever and Listeria outbreaks and also the study design and conduct of her immunisation determinant survey. The latter project also contributed in particular toward her improvement in areas of public health science. She could still develop further through more involvement in management, and in setting up a new surveillance system.

Dorothee has been a consistent and diligent fellow throughout her two years, persevering with projects even where progress was difficult or slow, and producing good outputs which have achieved her field objectives. She has listened to and considered all critical inputs and adapted her work accordingly in a measured way. I wish her great success in the future.

Personal conclusions of fellow

The EPIET Programme is a very good opportunity for Member State Fellows to strengthen and improve knowledge in epidemiology and get a good introduction in methodology of laboratory work, especially in antibiotic resistance. In the different modules, we acquire a solid theoretical basis in different topics like outbreak investigation, sampling strategies, data analysis and vaccination. At the same time, we can apply

our knowledge by working on case studies which were very useful. After the two years we have learned a lot about surveillance and management of infectious diseases in other countries in Europe and we are able to communicate results of our studies and investigation to an international audience.

Acknowledgements

First I want to thank ECDC and the State Health Office of Baden-Wuerttemberg for giving me the opportunity to participate in the EPIET programme. Thanks to Guenter Pfaff, Elisabeth Aichinger and Christiane Wagner-Wiening for supervision, support and helpful discussions and Christopher Williams, Public Health Wales, for being my coordinator and supporting me constantly. I appreciate the work of the other coordinators during the modules, during review process and conferences and say thanks to them all. Finally I want to thank my colleagues from State Health Office and the local health offices in Baden-Wuerttemberg for the excellent cooperation during my training. I also want to include in my thanks the participants of different projects for their contribution.

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10. Lohr D. Rubella in Baden-Wuerttemberg - What do we know about a few cases? [Presentation]. Workshop of WHO Tailoring Immunization Programme TIP, LGA, Stuttgart 17.12.2014

11. Lohr D. Influenzasaison 2014/15 in Baden-Württemberg. [Presentation]. General meeting of local health offices, Stuttgart 30.04. 2015

12. Lohr D. Masern in Baden-Württemberg -Hinweise zur Eingabe und Übermittlung von Masernfällen. [Presentation]. General meeting of local health offices, Stuttgart 30.04. 2015

13. Lohr D. Bericht aus der Bund-Länder-Arbeitsgruppe 03. und 04. November 2015 in Berlin (RKI). [Presentation]. General meeting of local health offices, Stuttgart 03.12.2015

14. Lohr D. Q-Fieber in einer psychiatrischen Klinik in Baden-Württemberg, 2015 - Ausbruchsuntersuchung. [Presentation]. General meeting of local health offices, Stuttgart 12.04.2016

15. Lohr D. Q-Fieber im Sommer 2015 – Ausbruchsberichte. [Presentation]. LGA-Kolloquium, Stuttgart 23.09.2015

16. Lohr D. Ergebnisse der Lebensmittelanamnese zum Listerienausbruch PFGE 13a/54. [Presentation]. Bund-Länder-Arbeitsgruppe zum IfSG-Meldewesen, Berlin 03. – 04.11.2015

17. Lohr D. Studie zu Faktoren, die die Masern-Durchimpfungsrate von Schulanfängern beeinflussen – Einführung und Ziele. [Presentation]., Abschluss ESU 2016 – Auftakt ESU 2017, Stuttgart and Freiburg 14.09.2015 and 15.09.2015

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