

## Mario Martín Sánchez

The European Programme for Intervention Epidemiology Training (EPIET), Cohort 2022

Robert Koch Institute, Germany

## Background

The ECDC Fellowship Programme is a two-year competency-based training with two paths: the field epidemiology path (EPIET) and the public health microbiology path (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. The Administrative Decisions [ECDC/AD/2023/23](#) and [ECDC/AD/2023/06](#) govern the EU-track and MS-track, respectively, of the ECDC Fellowship Programme, field epidemiology path (EPIET) and public health microbiology path (EUPHEM).

Both curriculum paths provide training and practical experience using the 'learning by doing' approach at acknowledged training sites across the European Union/European Economic Area (EU/EEA). This final report describes the experiences and competencies the fellow acquired by working on various projects, activities, theoretical fellowship training modules, other modules or trainings, and international assignments or exchanges during the fellowship.

## Pre-fellowship short biography

Mario Martín Sánchez is a medical doctor with a specialisation in preventive medicine and public health. He holds a Master's degree in Public Health from the Universitat Pompeu Fabra, Barcelona. Prior to the fellowship, Mario worked in Barcelona at both the hospital and local, regional public health levels, focusing on communicable disease prevention and control, health information systems, and quality of care. During this period, he also interned at the World Health Organization (WHO) in the Department of Noncommunicable Diseases, Rehabilitation and Disability, and at the Melbourne Sexual Health Centre in Australia in the Health Data Management and Biostatistics Unit. After finishing his medical specialisation training, Mario worked as an epidemiologist at the Public Health Agency of Barcelona in the course of the COVID-19 pandemic, participating in the response efforts during the first pandemic wave. Subsequently, he worked at the School of Public Health of the University of Hong Kong for two years, where he conducted applied research on COVID-19 and taught and coordinated courses for undergraduates in the Faculty of Medicine and the Master of Public Health programme.

## Results

The objectives of the core competency domains were achieved partly through project and activity work and partly by participating in the training modules. Results are presented in accordance with the EPIET/EUPHEM core competencies, as set out in the ECDC Fellowship Manual<sup>1</sup>.

<sup>1</sup> European Centre for Disease Prevention and Control (ECDC). European public health training programme. Stockholm: ECDC; 2020. Available from: <https://www.ecdc.europa.eu/en/publications-data/ecdc-fellowship-programme-manual-cohort-2021>

# 1. Epidemiological investigations

## 1.1. Outbreak investigations

### *Plasmid-mediated outbreak of NDM-4-producing Klebsiella pneumoniae affecting multiple hospitals and federal states in Germany, 2023–2024*

**Supervisors:** Mirco Sandfort, Sebastian Haller, RKI

**Category:** Healthcare-associated infections and antibiotic resistance

**Aim:** To support prospective and retrospective case finding and to investigate potential modes of transmission in the outbreak.

**Methods:** We combined data from mandatory surveillance for infectious diseases in Germany with pathogen sequence information. We defined a confirmed case as a person infected/colonised with NDM-4-producing *Klebsiella pneumoniae* (KP) since July 2023, with overlapping hospital stays with another case or an isolate in involved genetic clusters. Isolates were sent to the national reference laboratory for whole genome sequencing (WGS). We conducted descriptive analyses to detect overlaps between hospital stays.

**Results:** From July 2023 to February 2024, 68 cases of confirmed NDM-4-KP were detected. Among them, 53 (78%) were >64 years, 34 (50%) were female, 42 (62%) infected and 26 (37%) colonised. Cases occurred in at least five different hospitals in two federal states, but mainly in two hospitals (hospital A and B). WGS revealed that isolates from cases primarily belonged to two genomic clusters: 43 to cluster 1 (29 in hospital A and 11 in B) and 16 to cluster 2 (7 in hospital A and 7 in B). Isolates belonging to both clusters were retrieved from one case. Analyses of hospital stays showed continuous hospitalisation overlaps. Preliminary results suggested that a plasmid carrying the NDM-4-gene was present in the isolates of at least 64 cases.

**Public health implications:** After ruling out multiple parallel NDM-4-KP introductions, we concluded that a plasmid-mediated NDM-4-KP outbreak occurred, spread by patient-to-patient transmission, within-host horizontal NDM-4 transfer, and patient transfers between hospitals. Epidemiological data and microbiological data have to be analysed together to elucidate transmission in complex outbreaks.

**Role:** Mario contributed to formulating the objectives of the outbreak investigation and discussing its methods. He conducted case finding by reviewing notified cases and updating the line list with information from the notified cases and isolates from the National Reference Centre for Multidrug-Resistant Gram-Negative Bacteria. Mario conducted descriptive analyses, including detailed descriptions of hospitalisation stays and network analyses. He also helped in drawing conclusions from the outbreak investigation and formulate recommendations, drafted the first version of the outbreak report, and worked on a scientific manuscript with the findings (see, '[4.1. Manuscripts published in peer-reviewed journals](#)').

### *Corynebacterium diphtheriae outbreak among migrants recently arrived in Germany, Germany, 2022–2023*

**Supervisors:** Wiebe Külper-Schiek, RKI

**Category:** Vaccine-preventable diseases

**Aim:** To investigate the source and extent of the outbreak to guide the implementation of control measures.

**Methods:** Descriptive study using epidemiological, microbiological and phylogenetic data from the surveillance system for notifiable infectious diseases in Germany and the German National Consiliary Laboratory on Diphtheria.

**Results:** Since July 2022, there has been an increase in cases of diphtheria caused by toxigenic *Corynebacterium diphtheriae* among migrants who recently arrived in Germany, similar to other European countries. The initial outbreak investigation included 44 cases in Germany between January and September 2022. Most cases had cutaneous diphtheria (n=42) and were from Afghanistan and Syria. All the cases were male and the median age was 18 years. The investigation found that the outbreak most likely originated from abroad, although no single epicentre was identified. Until 5 March 2023, at least 167 outbreak-related cases were reported to the RKI from 12 German federal states with similar demographic and clinical characteristics to those described during the initial outbreak investigation. No diphtheria-related deaths were reported. Throughout this period, the team at RKI stayed in contact with local and federal state health authorities, who were reminded to follow recommendations for the management of cases of diphtheria and their contacts, and for outbreaks of infectious diseases in communal accommodation settings. Regular and timely communication was continued with other countries and institutions in Europe.

**Public health implications:** Effective outbreak identification and response requires the contribution of multiple partners, especially in a multi-country outbreak. Up-to-date information on the outbreak supports the implementation of infection prevention and control measures, such as targeted vaccination.

**Role:** Mario joined the outbreak investigation in September 2022. Mario performed case finding through intensified surveillance activities, updated the outbreak line list used by the team at the RKI, and contributed to a line list used by the ECDC. Mario managed the communication of new cases and relevant updates through the European surveillance portal for infectious diseases (EpiPulse) and performed regular descriptive epidemiological analyses to

inform various stakeholders about the outbreak evolution. Mario was involved in communicating findings through contributing to publications in peer-reviewed journals and presentations to international audiences.

### ***Measles outbreak in a reception centre in Berlin, for people from Ukraine, April–May 2024***

**Supervisors:** Dorothea Matysiak-Klose, RKI

**Category:** Vaccine-preventable diseases

**Aim:** To describe a measles outbreak among people from Ukraine and staying in a reception centre in Berlin.

**Methods:** Cases were described based on time, person and place. Data sources used were a case list with epidemiological and clinical information collected by the local health authorities, information from the surveillance system for notifiable infectious diseases in Germany, and administrative information collected by the operator of the reception centre.

**Results:** Between April and May 2024, there was an outbreak of measles with 52 confirmed cases, of which 51 were people staying at the reception centre and one was a staff member. The median age was 14.5 years (0–66, interquartile range: 5.75–33.2). During this period, a total of 5,612 people coming from Ukraine stayed at the reception centre. The first case had an exanthema beginning on 31 March 2024 and was diagnosed five days later. The primary case of the outbreak remains unknown. Among the confirmed cases, 16 had at least one documented measles vaccination.

**Public health implications:** Living conditions in reception centres, may put people at risk of infection. Refugees escaping crises and other migrants without appropriate measles vaccination protection housed in communal accommodation should be offered measles vaccination upon arrival in accordance with the recommendations of the German Standing Committee on Vaccination (STIKO) to protect their health and that of the other residents – irrespective of their residence status.

**Role:** Mario participated in the initial meetings of the outbreak investigation team and provided methodological and data analysis support for the descriptive part of the study. For example, by operationalising key variables, merging databases and supporting the creation of epidemic curves using R.

## **1.2. Surveillance**

### ***Evaluation of Epidemic Intelligence from Open Sources (EIOS) for international event-based surveillance at the RKI, Germany, 2023***

**Supervisors:** Sofie Gillesberg Raiser and Sarah Esquevin, RKI

**Aim:** To evaluate the use of Epidemic Intelligence from Open Sources (EIOS) for event-based surveillance (EBS) through media scanning for the early detection of international events that may pose a threat to public health in Germany.

**Methods:** We adapted the definition of surveillance system attributes to EIOS for EBS. We defined and developed new indicators for each attribute which were prioritised by the public health intelligence (PHI) team at the RKI. Out of 14 attributes, seven (timeliness, sensitivity, positive predictive value, completeness, usefulness, flexibility, simplicity) were selected for the evaluation. We performed a mixed methodology evaluation including quantitative and qualitative analyses.

**Results:** During two evaluation weeks, 20 international events were reported by the PHI team. Of these, 16 could be found on EIOS and four came from restricted sources. Increasing the number of sources within EIOS screened routinely by the PHI team could increase sensitivity but significantly decreased the positive predictive value and subsequently increased the workload. EIOS for international EBS was considered sensitive and timely enough for the objectives of the surveillance system. System users rated EIOS for EBS as simple and flexible, but identified challenges related to its usefulness for event documentation and reporting.

**Public health implications:** Defining and implementing methodologies for the evaluation of EBS systems, more specifically EIOS, can be challenging due to the scarcity of tools and guidelines. The evaluation yielded recommendations for enhancing the early detection of international health threats in Germany that may also serve as a source of guidance for the global EIOS and PHI community.

**Role:** Mario led the operationalisation and implementation of the evaluation framework supported by the supervisors. Mario designed the data collection tools and conducted the data collection and analysis. Mario wrote the first draft of the protocol and study report, as well as the final version after revision from supervisors. Mario maintained communication with other PHI teams outside Germany, the ECDC and the WHO Global Hub for Pandemic and Epidemic Intelligence. Mario presented the results to relevant stakeholders and at an international conference. He also drafted a manuscript for an international peer-reviewed journal ( see, [4.1. Manuscripts published in peer-reviewed journals](#) ).

## *Routine surveillance activities*

### *Indicator-based surveillance of diphtheria, Germany, 2022–2023*

**Activities and role:** Regular verification and analysis of surveillance data on diphtheria from the reporting system for surveillance of notifiable infectious diseases in Germany. This includes single case control according to the surveillance case definition for cases of *Corynebacterium (C.) diphtheriae*, *C. ulcerans* and *C. pseudotuberculosis*, death control, trend control and detection of outbreak signals.

Mario was the author of the chapter for diphtheria in the 2022 yearbook for infection epidemiology. He was in charge of the revision of the monthly validation of the data from Germany for The European Surveillance System (TESSy). Mario communicated regularly with different stakeholders regarding diphtheria surveillance in Germany (internally within RKI, ECDC, federal states and local public health authorities in Germany and the National Consiliary Laboratory for Diphtheria).

### *Indicator-based surveillance of nosocomial outbreaks, Germany, 2024*

**Activities and role:** Weekly review and analysis of surveillance data on nosocomial outbreaks from the reporting system for the surveillance of notifiable infectious diseases in Germany. This includes outbreaks of cases of Enterobacterales, *Acinetobacter spp.*, *Candida auris*, Methicillin-resistant *Staphylococcus aureus*, and other reports on the cumulative occurrence of nosocomial infections.

Mario wrote weekly reports using an R script that included all new outbreaks of the week or outbreaks with new cases during the report week. For each outbreak, key characteristics (number of cases, location, dates of case report and symptom onset, number of deaths, resistance genes) were described. The report was sent to experts in the Unit of Healthcare-associated Infections, Surveillance of Antibiotic Resistance and Consumption and other departments at RKI. Bimonthly meetings were held to discuss the reports and decide which outbreaks required additional data analysis, enhanced surveillance, or proactive contact with the regional health authority.

### *German epidemiological situation conference (EpiLag), Germany, 2022–2023*

**Activities and role:** The EpiLag takes place weekly with participants from federal state public health authorities, consultants for infection protection of the federal states, and representatives of the German armed forces. The EpiLag enables the communication and identification of public health events in Germany and provides a forum to discuss issues related to infectious disease surveillance and response.

Mario regularly attended the EpiLag and provided editorial support, including gathering all relevant information for the teleconference from the stakeholders and preparing updates on international and other infectious disease issues. On the day of the conference, Mario took notes of the discussions and drafted the weekly conference notes which were circulated to all the participants and public health stakeholders.

### *Intensified surveillance during the mass gathering event UEFA EURO 2024, Germany, 2024*

**Activities and role:** Intensified surveillance activities were implemented during the UEFA European Football Championship 2024 (EURO) in Germany combining enhanced indicator-based routine surveillance and media monitoring using Epidemic Intelligence from Open Sources (EIOS).

During the days on duty, Mario screened EIOS articles for signals of infectious disease events in Germany that could be related to the UEFA EURO 2024 and communicated them to relevant stakeholders at national and international levels. Mario drafted the bi-weekly intensified surveillance report including signals from EIOS and other sources that were discussed in a round-table and shared with the German federal state health authorities.

### *International communication activities within the crisis management team, Germany, 2023–2024*

**Activities and role:** The communication activities through the Early Warning and Response System (EWRS) or the National International Health Regulations Focal Point system (IHR-NFP system) enable the timely exchange of information to ensure that control and prevention measures can be implemented by national and international health authorities.

Mario joined the roster of people working on communication events through the EWRS and IHR-NFP system, focusing on assessing and forwarding information from local health authorities in Germany related to cases of infectious disease or events to the appropriate international health authorities.

## ***Screening the Rapid Alert System for Food and Feed (RASFF), Germany, July 2023 and July 2024***

**Activities and role:** The Rapid Alert System for Food and Feed (RASFF) is a platform for the rapid exchange of important food safety information between the food safety authorities of the RASFF member countries. The RKI screens the RASFF alerts, which are provided daily by the German RASFF food safety contact points, for alerts on food contaminated with notifiable infectious organisms of relevance to human health. Potentially useful information is then forwarded to federal and local health authorities. The information provided to federal and local public health authorities may support their investigation of reported cases of the relevant infectious diseases and assist in the investigation of outbreaks.

For two months, Mario was responsible for reviewing and summarising the available information and informing the relevant authorities about potential sources of food-borne infectious diseases or disease outbreaks.

## **2. Applied public health research**

### ***Relationship between discrimination and sexual decision-making among trans and non-binary people in Germany***

**Supervisors:** Uwe Koppe and Kathleen Pöge, RKI

**Aim:** To explore the relationship between discrimination based on gender identity and sexual decision-making to feel protected against HIV and sexually transmitted infections (HIV/STI) among trans and non-binary people in Germany, and to assess whether feeling unable of making HIV/STI-protected sex decisions was associated with behaviours related to increased HIV/STI risk.

**Methods:** We conducted a cross-sectional study using data from the Sexual Health and HIV/STI in Trans and Non-Binary Communities (TASG) survey conducted online between March–July 2022 among trans and/or non-binary people aged 18 years and older living in Germany. We calculated prevalence ratios (PR) with 95% confidence intervals (95% CI) for the associations between frequent experienced discrimination based on gender identity and feeling unable to make HIV/STI-protected sex decisions, and between feeling unable to make HIV/STI-protected sex decisions and behaviours related to increased HIV/STI risk.

**Results:** Among 3,077 study participants, 22% reported frequent discrimination based on gender identity. Participants experiencing such discrimination reported 1.4 times more often feeling unable to make HIV/STI-protected sex decisions (PR 1.4, 95% CI 1.1–1.8). This perceived inability was associated with increased prevalence of sex under drug influence (PR 2.9, 95% CI 2.3–3.7) and condomless penetrative sex with multiple partners without PrEP (PR 2.1, 95% CI 1.5–3.0).

**Public health implications:** There is a lack of information on the sexual health and determinants of trans and non-binary people in Germany. In this study, we identified sexual decision-making as a key factor related with both discrimination and behaviours associated with increased HIV/STI risk.

**Role:** Mario wrote the protocol and operationalised the exposures and outcome for the study and conducted the data analysis. Mario wrote an abstract that was accepted presented in an oral session during the 25th International AIDS Conference in July 2024 and submitted a manuscript to a peer-reviewed journal (see '[4.1. Manuscripts published in peer-reviewed journals](#)').

### ***Evaluation of the RKI COVID-19 Task Forces to support local and federal state health authorities in outbreak investigations, Germany, 2020–2021***

**Supervisors:** Nadine Zeitlmann, RKI

**Aim:** To evaluate the performance of the RKI's outbreak task forces (RKI-TF) deployed during the COVID-19 pandemic to German local and state public health authorities to support with outbreak investigation.

**Methods:** We conducted a retrospective cross-sectional survey. We administered an online questionnaire to all local (n=376) and state public health authorities (n=16) between 9 March 2023 and 12 May 2023 including questions pertaining to satisfaction, timeliness, and benefits of the RKI-TF in case of deployment and barriers in case of non-deployment.

**Results:** 146 authorities participated. Of those, 21 had requested RKI-TF-deployments. The most common reasons for requesting help were need for additional expertise (n=19) and lacking personnel resources (n=13). The main reasons for the 125 authorities not requesting help were no need for assistance (60%; 56/94) and lack of experience (31%; 29/94) or knowledge (29%; 27/94) about the official procedures of seeking RKI assistance. 15 authorities provided information on 22 deployments. Their median duration was four days (range 1–26). Overall, the RKI-TF-deployments were rated as very satisfactory/satisfactory (n=20) and timely (n=19). Conducting analytical epidemiology (n=18) and transfer of scientific knowledge from RKI-TFs (n=16) were considered the biggest benefits of the RKI-TF-deployments.

**Public health implications:** The local and state public health authorities provided positive feedback on the RKI-TF-deployments, which may help in consolidating the use of these deployments for other outbreaks in the future.



Additionally, gaps in knowledge about request and deployment procedures were identified. These gaps are being addressed by the RKI through regular training and information dissemination.

**Role:** Mario co-designed the questionnaire and implemented it on the online survey platform. Mario conducted the data extraction and analysis and wrote the first version of a manuscript and submitted it to a peer-reviewed journal in German (see [4.1. Manuscripts published in peer-reviewed journals](#)). Mario presented the results internally at the RKI during the colloquium of the Department of Infectious Disease Epidemiology, externally in Germany at the meeting of the Surveillance Working Group of the Federal State Health Authorities (BLAG) and at the Scientific Congress of the Federal Association of Physicians of German Public Health Authorities (BVÖGD), and internationally at the European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2024.

### ***Key informant interviews for the ABCM project (Assessing and Building Capacities: Madagascar's public health system), Antananarivo, Madagascar, 2023***

**Supervisors:** Charbel El Bcheraoui, Brogan Geurts and Claudia Pereira, RKI

**Aim:** The ABCM project aims to assess Madagascar's public health system and strengthen its diagnostic capacity.

**Methods:** The Ministry of Health in Madagascar officially requested the RKI's support in setting up a Centre for Disease Control and building capacity for the diagnosis of tropical infectious diseases in the country. In a joint effort with the Ministry of Health and the National Institute of Public and Community Health in Madagascar (Institut National de Santé Publique et Communautaire - INSPC), a team including two RKI researchers and Mario interviewed 36 key informants between 16 and 24 August 2023 to map and understand the current state of the public health system in Madagascar. The key informants discussed the essential public health functions (EPHF) as they relate to the strengthening and resilience of the public health system. Key informants included individuals working in each of the EPHFs and represented multi-level stakeholders from the central government, international organisations and NGOs, as well as local community implementers and experts.

**Finding:** The overall project is ongoing. The results of the interviews have been used to prioritise functions and areas considered appropriate for further in-depth research and potential development of competencies in public health functions in the next steps of the project.

**Public health implications:** The ABCM project will serve to develop a roadmap for a stronger and more resilient public health system in Madagascar.

**Role:** Data and document management, contribution to agenda planning for the mission, revision and adaptation of the data collection tool for the key informant interviews, and data collection through interviewing (in the role of note-taker or co-interviewer).

## **3. Teaching and pedagogy**

### ***Diphtheria in Germany and in the German Public Health Service: Training for Participants of the Course on Hygiene Control, by the Academy for Public Health Services in Germany (AÖGW), 19–20 April 2023, Berlin (online), Germany***

The training consisted of pre-course activities and two three-hour sessions delivered online. The objective was for participants to be able to manage cases of diphtheria and their close contacts, interpret laboratory results and to be aware of the legal requirements and practical handling of notification and reporting of cases of diphtheria. The course was designed and delivered in collaboration with Wiebe Külper-Schick and included an icebreaker, presentations and interactive exercises. Evaluation was both quantitative (by students) and qualitative (by students and peers).

### ***An introduction to applied epidemiology, ZIBI lecture series Infection Biology, 6 July 2023, Berlin (online), Germany***

The one-hour lecture covered the basic concepts of applied epidemiology, including surveillance, presented by Mario, and the 10 steps of an outbreak investigation, presented by Henrieke Prins. The audience comprised international PhD students from the Centre for Infection Biology and Immunity (ZIBI Graduate School Berlin) with backgrounds in bacteriology, virology and immunology. The presentation was followed by a question and answer session.

### ***Facilitator at the EpiKurs: module Outbreak investigation, 9–11 October 2023, Berlin (face-to-face), Germany***

This was a three-day, full-time training attended by 36 participants working in the field of infection control in the German public health sector. The course covered how to investigate outbreaks of food-borne infectious diseases and how to write an outbreak report. 12 RKI staff were responsible for the organisation, lecturing and facilitation of the group activities. Mario presented the steps of the outbreak investigation: 'confirmation of the existence of an outbreak' and 'case finding'; and acted as facilitator during the group activities.

### ***Facilitator at Epidemic Intelligence from Open Sources (EIOS) Training for RKI workers participating in the intensified UEFA surveillance, 20–21 March 2024, Berlin (face-to-face), Germany***

This was a two-day full-time training course with lectures, practical demonstrations, exercises and supervised independent work focusing on the use of EIOS for media scanning. The course was organised by the Information Centre for International Health Protection at the RKI and attended by RKI staff involved in the intensified UEFA surveillance. Mario was in charge of two practical demonstrations. He supervised exercises and autonomous work of the participants.

## **4. Communications related to the EPIET/EUPHEM fellowship**

### **4.1. Manuscripts published in peer-reviewed journals**

**Martín-Sánchez M**, Pöge P, Hahne A, Hamm J, Bremer V, Koppe U. Discrimination based on gender identity and decision-making regarding HIV/STI-protected sex, a cross-sectional study among trans and non-binary people in Germany. BMC Public Health. Publication pending.

**Martín-Sánchez M**, Siffczyk C, Loenenbach A, Kajikhina K, Zeitlmann N. Evaluation of RKI field operations in support of local and federal health authorities during the COVID-19 pandemic [Bewertung der RKI-Feldeinsätze zur Unterstützung der lokalen und föderalen Gesundheitsbehörden während der COVID-19-Pandemie]. Publication pending.

**Martín-Sánchez M**, Raiser SG, Esquevin S, Jansen A. Design, implementation and results of the evaluation of Epidemic Intelligence from Open Sources (EIOS) for international public health intelligence at the Robert Koch Institute, Germany. Publication pending.

Sing A, Badenschier F, Dangel A, Sprenger A, Hobmaier B, Külper-Schiek W, Prins H, **Martin-Sanchez M**, et al. Clustering of Diphtheria Cases in Refugees That Arrived in Germany in 2022. Dtsch Arztebl Int. 2023;120(33-34):557-558. Available at: <https://www.aerzteblatt.de/int/archive/article/233420>

### **4.2. Other reports**

Robert Koch Institute. Infectious epidemiological yearbook of notifiable diseases for 2022, Berlin 2024– Diphtheria chapter [Infektionsepidemiologisches Jahrbuch für meldepflichtiger Krankheiten, Berlin 2024 - Diphtherie]. Available at: [https://www.rki.de/DE/Content/Infekt/Jahrbuch/Jahrbuch\\_2022.pdf?\\_\\_blob=publicationFile](https://www.rki.de/DE/Content/Infekt/Jahrbuch/Jahrbuch_2022.pdf?__blob=publicationFile)

Robert Koch Institute. Public Health Intelligence weekly and daily reports for calendar week 19 and 23, 2023. Internal document.

Robert Koch Institute. Report on the results of the intensified surveillance for the UEFA Euro 2024 for 18 June, 16 July, 19 July and 30 July 2024. Internal document.

### **4.3. Conference presentations**

**Martín-Sánchez M**, Siffczyk C, Loenenbach A, Kajikhina K, Zeitlmann N. Performance of the Robert Koch Institute's outbreak task forces during COVID-19: An evaluation (Oral presentation). ESCAIDE 2024; 20–22 November 2024; Stockholm, Sweden.

**Martín-Sánchez M**, Esquevin S, Jansen A, Raiser SG. Epidemic Intelligence from Open Sources (EIOS) to detect international public health events – an evaluation in the scope of public health intelligence activities at the Robert Koch Institute, Germany (Poster presentation). ESCAIDE 2024; 20–22 November 2024; Stockholm, Sweden.

**Martín-Sánchez M**, Kathleen Pöge, Alexander Hahne, Jonas Hamm, Viviane Bremer, Uwe Koppe, the TASG-study group. Relationship between discrimination, sexual decision-making and behaviors that increase the HIV/STI risk among trans and non-binary people in Germany (Oral presentation). AIDS 2024, the 25th International AIDS Conference; 26 July 2024; Munich, Germany.

**Martín-Sánchez M**, Siffczyk C, Loenenbach A, Kajikhina K, Zeitlmann N. How useful were the RKI's COVID-19 field operations for outbreak investigation? Results of a German Public Health Service survey. [Wie nützlich waren die COVID-19-Feldeinsätze des RKI? Ergebnisse einer ÖGD Befragung] (Oral presentation). 73rd Scientific congress of the Federal Association of Physicians of German Public Health Departments [BVÖGD]; 26 April 2024; Hamburg, Germany.

**Martín-Sánchez M**, Esquevin S, Jansen A, Raiser SG. Identification and definition of attributes to evaluate international event-based surveillance using Epidemic Intelligence from Open Sources (EIOS) at the Robert Koch Institute, Germany (Online poster). ESCAIDE 2023; 22–24 November 2023; Barcelona, Spain.

Sarma N, **Martín-Sánchez M**, Larscheid P, Möller-Kutzki M, Ruscher C, Schmid B, et al. Measles outbreak in a mass reception centre for refugees in Berlin, Germany, April-May 2024: A call for better protection of newly arriving refugees (Oral presentation). ESCAIDE 2024; 20–22 November 2024; Stockholm, Sweden.

Schneider L, Badenschier F, **Martín-Sánchez M**, Wichmann O, Külper-Schick W, Perriat D. Spotlight on *Corynebacterium* (C.) diphtheriae and *C. ulcerans*: Results of enhanced diphtheria surveillance in Germany, 2017 – 2022 (Poster presentation). ESCAIDE 2024; 20–22 November 2024; Stockholm, Sweden.

Badenschier F, Dörre A, Külper-Schick W, Prins H, **Martín-Sánchez M**, Sing A, et al. Sudden increase of diphtheria with *Corynebacterium diphtheriae* among migrants arriving in Germany, 2022: statistical outlier or detection of an outbreak? (ePoster presentation). 33rd European Congress of Clinical Microbiology and Infectious Diseases (ECCMID); 18 April 2023; Copenhagen, Denmark.

Berger A, Dörre A, Külper-Schick W, Prins H, **Martín-Sánchez M**, Sprenger A, et al. Increase of *Corynebacterium diphtheriae* cases among migrants arriving in Germany since 05/2022 (Poster presentation). 75th Annual Conference of the German Society for Hygiene and Microbiology (DGHM); 18–20 September 2023, Lübeck, Germany.

## 4.4. Other presentations

**Martín-Sánchez M**. Outbreak of NDM-4 *Klebsiella pneumoniae* in two German federal states, July 2023-Feb 2024. Presented at: Epidemiology in Healthcare Settings. PAE/UKHSA Module; 3 July 2024; Berlin, Germany.

**Martín-Sánchez M**, Siffczyk C. Initiatives for outbreak task forces at various levels (EU, RKI, German federal states). [Initiativen für Ausbruchs--Task Forces auf verschiedenen Ebenen (EU, RKI, Bundesländer)]. Presented at: Weekly colloquium of the Department of Infectious diseases epidemiology at RKI; 13 May 2024; Berlin, Germany.

**Martín-Sánchez M**. Results of the evaluation of EIOS for international event-based surveillance at RKI. Presented at: meeting with the EIOS Core Team at the WHO Global Hub for Pandemic and Epidemic Intelligence; 24 January 2024; Berlin, Germany.

**Martín-Sánchez M**. Methods and results of the evaluation of EIOS for international event-based surveillance at RKI. Presented at: meeting with the public health intelligence team at RKI, ECDC and UKHSA focused on evaluation methods; 6 October 2023; Stockholm, Sweden (Online).

**Martín-Sánchez M**. Protocol for the evaluation of EIOS for international event-based surveillance at RKI. Presented at: weekly meeting of the Information Centre for International Health Protection (ZIG1) at RKI; 31 May 2023; Berlin, Germany.

Mendez Brito A, **Martín-Sánchez M**. Public Health Intelligence Experience sharing. Presented at: PAE Jour Fixe 2024; 18 January 2024; Berlin, Germany.

Raiser SG, **Martín-Sánchez M**. Presentation of the work of Fellows in the Public Health Intelligence team. Presented at: PAE Jour Fixe 2023; 25 July 2023; Berlin, Germany.

## 5. EPIET/EUPHEM modules attended

- Introductory Course, 26 September–14 October 2022, Spetses, Greece
- Outbreak Investigation, 5–9 December 2022, Berlin, Germany
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2022, 23–25 November 2022, Stockholm, Sweden
- Multivariable Analysis, 22–26 May 2023, Frankfurt, Germany
- Rapid Assessment and Survey Methods, 19–23 June 2023, Stockholm, Sweden
- Project Review Module 2023, 28 August–1 September 2023, Lisbon, Portugal
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2023, 22–24 November 2023, Barcelona, Spain
- Time Series Analysis, 11–15 December 2023, Rome, Italy
- Vaccinology, 4–8 March 2024, virtual



- Management, Leadership and Communication in Public Health, 24–28 June 2024, Stockholm, Sweden
- Project Review Module 2024, 26–30 August 2024, Lisbon, Portugal
- European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) 2024, 20–22 November 2024, Stockholm, Sweden

## 6. Other training

- Master of Science in Applied Epidemiology, Berlin School of Public Health, 1 September 2022–30 September 2024, Berlin, Germany
- Epidemiology in Healthcare Settings. PAE/UKHSA Module, 3–5 July 2024, Berlin, Germany
- EAN Molecular Epidemiology mini-module, 20–21 November 2023, Barcelona, Spain
- United Nations System Staff College (UNSSC) Safe and Secure Approaches in Field Environments (SSAFE) course for Surge Deployment, 12–14 September 2023, Torino, Italy
- PAE laboratory module, 20–23 March 2023, Berlin, Germany
- Intro to R course by Applied Epi, 28 November–1 December 2022, Virtual
- Causal inference with DAGs, 10 October, 1, 9 November and 30 November, and 14 December 2022, Virtual
- PAE introduction days 2022, 12–16 September 2022, Berlin, Germany

## 7. International assignments

Two-week deployment to support the data collection through key informant interviews for the ABCM Project (Assessing and Building Capacities: Madagascar Public Health System). Antananarivo, Madagascar, August 2020 (see 2. 'Applied public health research').

## 8. Other activities

- Attendance to the 72nd Scientific congress of the Federal Association of Physicians of German Public Health Departments (BVÖGD), 26–29 April 2023, Potsdam, Germany
- One-week training and three weeks on duty with the public health intelligence team of the Information Centre for International Health Protection (ZIG1) at RKI
- Internship at local public health authority of Berlin Steglitz-Zehlendorf, 11–15 March 2024, Berlin, Germany

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