

CORE COMPETENCIES IN APPLIED INFECTIOUS DISEASE EPIDEMIOLOGY		Insert level of Importance (1-5)	Comments
Competency Domains / Competencies within Domains	(ECDC UCCAIDE Project_Structured Interview.V.6_15Jan2021)	Public Health Practitioners	
Domain #1: Principal Subject Area (Infectious Diseases (ID))*		PHP	
A. Generic knowledge of Infectious Diseases			
	<ul style="list-style-type: none"> History of Infectious Diseases 		
	<ul style="list-style-type: none"> Global Burden of Infectious Diseases 		
	<ul style="list-style-type: none"> International organisations responsible for monitoring infectious diseases globally 		
	<ul style="list-style-type: none"> Federal, Regional, National Agencies responsible for monitoring infectious diseases locally 		
	<ul style="list-style-type: none"> Infectious Diseases Legislation (International/ country-specific) 		
B. Knowledge of known and potential sources of infection (Country-specific)			
	<ul style="list-style-type: none"> Food-borne; water-borne; air-borne; blood-borne; other 		
	<ul style="list-style-type: none"> Healthcare associated infections 		
	<ul style="list-style-type: none"> Vectors for infectious diseases 		
	<ul style="list-style-type: none"> Zoonotic infectious diseases 		
C. Knowledge of SYSTEMS applicable to all Infectious Diseases:			
C.1 Infectious Disease Surveillance			
	<ul style="list-style-type: none"> Purpose, systems and processes of surveillance in infectious diseases 		
	<ul style="list-style-type: none"> Legal and statutory obligations relating to ID surveillance 		
	<ul style="list-style-type: none"> Notifiable Infectious Diseases (country-specific) 		
	<ul style="list-style-type: none"> Analysis of surveillance data 		
	<ul style="list-style-type: none"> Time series analysis 		
	<ul style="list-style-type: none"> Completeness of surveillance data 		
C.2 Infection Prevention			
	<ul style="list-style-type: none"> Living conditions / hygiene / sanitation / waste disposal / burial 		
	<ul style="list-style-type: none"> Vector control / practical procedures in infection prevention and control (IPC)* 		
	<ul style="list-style-type: none"> Personal Protection Equipment (PPE) - education and practice 		
	<ul style="list-style-type: none"> Aspects of behavioural science relevant to IPC practices 		
	<ul style="list-style-type: none"> Vaccination: Development / Requirements / Schedules (country-specific) 		
C.3 Infection Control (Public Health Measures)			
	<ul style="list-style-type: none"> Recognition / Vigilance / Notification of ID 		
	<ul style="list-style-type: none"> Outbreak investigation 		
	<ul style="list-style-type: none"> Risk assessment 		
	<ul style="list-style-type: none"> Testing Capacity 		
	<ul style="list-style-type: none"> Contact Tracing 		
	<ul style="list-style-type: none"> Criteria of isolation and quarantine 		

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C.4 Infection Control (Treatment)			
<ul style="list-style-type: none"> Development and uses of antibiotics and antimicrobial agents 			
<ul style="list-style-type: none"> Stewardship programmes regarding the use of antibiotics and antimicrobial agents 			
<ul style="list-style-type: none"> Evolution of antimicrobial resistance (AMR) 			
D. Condition-specific knowledge and skills			
<ul style="list-style-type: none"> Developing case definitions 			
<ul style="list-style-type: none"> Infectious agent transmissibility and dynamics, including Reproductive Number 			
<ul style="list-style-type: none"> Disease-specific critical periods (e.g. incubation, infectious, contagious periods) 			
<ul style="list-style-type: none"> Knowledge of different methods for diagnosis and typing 			
<ul style="list-style-type: none"> Diagnostic tests (antibody, antigen, etc) 			
<ul style="list-style-type: none"> Validity and reliability of diagnostic tests 			
<ul style="list-style-type: none"> Management of cases and contacts 			
E. Understanding of Emerging Infections			
<ul style="list-style-type: none"> Event-based and indicator-based surveillance 			
<ul style="list-style-type: none"> Initiate investigations of new diseases / threats 			
<ul style="list-style-type: none"> Reporting in a timely manner on a national or international level 			
G. Laboratory and molecular methods for infectious diseases detection and diagnosis			
<ul style="list-style-type: none"> Basic understanding of laboratory tests (Disease specific) 			
<ul style="list-style-type: none"> Basic understanding of molecular tests and genomic analysis 			
<ul style="list-style-type: none"> Understanding of epidemiologic significance of genomic data 			
<ul style="list-style-type: none"> Clear communication between practitioners and the laboratory teams 			
F. Vaccinology			
<ul style="list-style-type: none"> Vaccine Preventable Diseases 			
<ul style="list-style-type: none"> Vaccine development / trials 			
<ul style="list-style-type: none"> Safety and efficacy of vaccines 			
<ul style="list-style-type: none"> Regulation of vaccines (National / International) 			
<ul style="list-style-type: none"> Vaccine logistics management 			
<ul style="list-style-type: none"> Vaccine monitoring (vaccination registry) and evaluation 			
<ul style="list-style-type: none"> Vaccination schedules and legislations (country specific) 			
<ul style="list-style-type: none"> Aspects of behavioural science relevant to vaccine uptake 			
H. One Health			

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<ul style="list-style-type: none"> • Definition of One Health and all it encompasses • Understanding of human-animal interactions • Assessment of One Health factors (e.g. animal health, food safety/security etc.) • Surveillance of risks and threats at local and international levels • Food safety, understanding of antimicrobial agents in the food chain • Definition and understanding of zoonotic infections 			
I. Climate Change impact on Infectious Diseases			
<ul style="list-style-type: none"> • Basic understanding of factors impacting on climate change • Understanding the effect of climate change on vector borne diseases • Ability to assess populations vulnerable to climate change 			
Domain #2: Methodological Frameworks (Epidemiology / Biostatistics)		PHP	
A. Knowledge and understanding of relevant epidemiological data			
<ul style="list-style-type: none"> • Population structures and dynamics • Sources of data on infectious diseases • Processes of compiling data on infectious diseases 			
B. Knowledge and skills in compilation and interpretation of epidemiological data			
<ul style="list-style-type: none"> • Understanding measures of diseases frequency, occurrence rates, case fatality rates • Comparisons of rates between regions and/or populations • Interpretation of trends in disease rates • Understanding the Epidemic Curve / Impact of mitigating factors • Understanding of concepts of association, causation and correlation 			
C. Knowledge and skills in epidemiological investigation methods			
<ul style="list-style-type: none"> • Skills in critical appraisal of scientific literature • Investigation of disease causation using epidemiological studies • Epidemiological study designs, appropriateness and capability • Role of RCTs in development of vaccines and treatments for infectious diseases • Understanding principles of measurement, bias, confounding • Ability to assess of measurement instruments and their properties • Estimation, interpretation and presentation of measures of risk associated with exposures 			
D. Data Management and Biostatistics			
<ul style="list-style-type: none"> • Skills in managing raw data in a variety of formats 			

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<ul style="list-style-type: none"> • Knowledge of, and proficiency in, database software packages for managing data • Knowledge of, and proficiency in, statistical software packages (SPSS, STATA, R, SAS) • Production of statistical protocols • Knowledge of, and proficiency in, selecting appropriate sampling strategies • Comprehension of statistical procedures and their applications • Comprehension of basic concepts of probability • Interpretation of point estimates, confidence intervals and significance levels • Interpretation and comprehension of estimates of risk • Proficiency in drawing conclusions from statistical analysis • Knowledge of, and proficiency in, report production 			
E. Disease Modelling (Mathematical Models and Assumptions)			
<ul style="list-style-type: none"> • Understanding assumptions for modelling infectious diseases • Understanding processes, interpretation and applications of disease modelling in ID 			
Domain #3: Public Health in Action		PHP	
<ul style="list-style-type: none"> • Use of event-based and indicator-based surveillance systems to detect health threats • Assess importance of case reports or clusters as indicators of need for further investigation • Know how to initiate an outbreak investigation • Understanding the cross-sectoral and multi-sectoral approaches to outbreak investigation • Identify agents responsible for outbreaks, and their epidemiological characteristics • Perform risk assessment • Communicate results and implications of risk assessments to policymakers with different backgrounds • Develop and disseminate public health advice, messages and recommendations • Put in place public health strategies e.g. Case Identification, Contact Tracing and follow up • Evaluation and feedback of public health strategies • Audit of public health interventions, e.g. within healthcare facilities, schools and communities • Identify challenges relevant for health promotion at various levels of social and political organisation • Evaluate the implications of national or international public health alerts for own Member State. • Characterise the current and potential human health consequences of population exposure to biological, chemical, radiological and nuclear hazards. • Significant aspects of the history of health promotion theory and practices, including main health promotion charters, e.g. Ottawa • Build capacity within Public health teams both within healthcare facilities and within the community setting 			
Domain #4: Communication		PHP	
A. Use of established / traditional forms of communication			

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	<ul style="list-style-type: none"> • Role of written and verbal communication to general public • Role traditional media (newspaper, radio and TV) and social media in dissemination of public health messages • Interaction of public health professionals with journalists 		
B	Understand Infodemiology and what it encompasses		
	<ul style="list-style-type: none"> • Know web-based sources (Internet sites, social media platforms - facebook, twitter, instagram etc.) • Identify valid quality criteria for websites and online content • Understanding of source criteria (i.e. authors) and technical criteria (i.e. means of presentation) • Understanding content criteria (i.e. evidence-based) • Keep relevant and up to date sources (e.g. shifts in internet use, age of users etc.) 		
C.	Communication specific to infectious Diseases		
	<ul style="list-style-type: none"> • Understanding key messages to public for maximum effectiveness • Vaccine hesitancy / misinformation • Intercultural knowledge and sensitivity • Understanding Health Literacy, including differences • Knowledge of, and proficiency in Risk Communication 		
Domain #5: Structural / Cultural Competency		PHP	
	<ul style="list-style-type: none"> • Understand health services governance and infrastructure in own country • Understand key services and players in health systems • Know how to access and use vital statistics and health indicators to generate evidence and advise strategy about population health • Understanding social epidemiology • Understand vulnerable groups in society - <ul style="list-style-type: none"> - Specific age groups e.g. infants, children and adults - Ethnic minorities e.g. Roma population - Migrant populations and assylum seekers - Disability groups • Know the services needed by , and services available to, vulnerable groups e.g. residential care facilities, direct provision centres, congregated settings, social health services • Cultural and language awareness and sensitivity • Understands social, cultural, economic and political determinants of health as drivers of health inequality • Impact of health and social inequality on infectious disease spread and severity. 		
Domain #6: Policy Development and Programme Planning (Knowledge K : Skill S)		PHP	

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<ul style="list-style-type: none"> • Understand organisation of health systems (K) • Understand principles of development, planning and implementation and evaluation of PH Policies, strategies, programmes and institutions (K) • Understand methods of development, planning and implementation and evaluation of PH Policies, strategies, programmes and institutions (S) • Understand of the national, EU, international and global PH strategies (K+S) • The role of national and international commerce in supporting or hindering the development of public health interventions (K) • Balance the interests of organisational, political and multi-agency agendas. (K+S) • Develop and implement a PH policy/strategy/intervention based on standard PH methods and guidelines (K+S) • Ethics in health policy-making, research and implementation (K+S) • Understand influences of political systems and political leadership on health matters (K) 			
Domain #7: Leadership and Decision Making		PHP	
A. Promote the epidemiologic perspective in the planning process.			
<ul style="list-style-type: none"> • Develop strategic plans • Collaborate with internal and external groups • Establish strategic priorities • Ensure budget resources is consistent with strategies 			
B. Implement and support change			
<ul style="list-style-type: none"> • Leading in change process • Sustain organisational change • Develop, implement and monitor performance measures of the organisation to demonstrate effectiveness and evaluate performance 			
C. Promote ethical conduct in epidemiologic practice			
<ul style="list-style-type: none"> • Enforce policies with ethical conduct • Commitment to quality • Social responsibility • Ethical conduct in personal behaviour • Protection of individuals • Data protection and confidentiality • Handle conflicts of interest 			
D. Ensure professional development of the epidemiologic workforce			
<ul style="list-style-type: none"> • Provide learning environment • Adjust workload according to needs and skills • Assess education needs 			

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	<ul style="list-style-type: none"> • Create curriculum for education needs and implement them • Skills for epidemiologic analyses (Ref domain 2) 		
E. Lead the epidemiologic team in preparing for emergency response (Overlap with Domain 1)			
<ul style="list-style-type: none"> • Incident recognition including- <ul style="list-style-type: none"> ▪ Event based and indicator based surveillance system ▪ Implications of public health alerts • Risk characterisation including- <ul style="list-style-type: none"> ▪ Identify agent responsible ▪ Characterise health consequence of the agent ▪ Risk assessment • Epidemiological investigation including- <ul style="list-style-type: none"> ▪ Lead the outbreak investigation ▪ Collaboration with public health epidemiologists • Lead the surveillance and epidemiological monitoring including- <ul style="list-style-type: none"> ▪ Establish event-based surveillance system ▪ Lead the accurate disease reporting • Lead the emergency response plan • Communication of roles and responsibilities • Evaluate the participation 			
F. Establish roles and responsibilities of all participants in the organisation			
<ul style="list-style-type: none"> • Delegate responsibilities and tasks • Communicate roles expectations clearly • Encourage team building and team work 			
G. Governance structures, locally and internationally			
<ul style="list-style-type: none"> • Interact with sensitivity with persons of diverse background, health status and lifestyle preferences • Ability to use working techniques with boards and governance structures • Encourage the European and national public health agenda • Assemble partners and build coalition to improve health of the population • Advocate and participate in public health policy initiatives • Develop policies to ensure compliance with regulatory bodies • Represent epidemiology programme on the public health agency management team 			
Domain #8: Financial Planning and Management		PHP	

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A. Financial knowledge and skills			
• Demonstrate knowledge of accounting principles			
• Interpret financial data and ability to communicate to the workforce			
• Formulate and implement budget plans for programmes			
• Support audit functions			
• Evaluate expenditure			
• Adjust activities within budget			
• Seek additional resources / prepare proposals for funding			
• Conduct epidemiological activities within financial plan of the organisation			
B. Establish roles and responsibilities of all participants in the organisation			
• Delegate responsibilities and tasks			
• Communicate roles expectations clearly			
• Encourage team building and team work			
* ID: Infectious disease, IPC: Infection Prevention and Control, PPE: Personal Protective Equipment, AMR: Antimicrobial Resistance			
ECDC UCCAIDE Project_Structured Interview.V.5 Jan2021			