

## **Transforming Public Health Surveillance**

### **COURSE DURATION**

This is an on-line, distance learning course and material will be available from:  
Wednesday, June 1, 2016 - Friday, July 1, 2016 - 11:59 PM

### **INSTRUCTOR**

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### **COURSE DESCRIPTION**

The Transforming Public Health Surveillance course will introduce lessons learned in international health crises, and construct a framework to provide efficient, effective, and equitable global response. It will describe enriched collaborations between military, clinical practice, societies, communities, and governmental and non-governmental organizations and discuss challenges and opportunities. The course will also describe informatics approaches to enable and support data sharing, analytics, and visualization through interoperability that will adapt to meet the challenges of the changing field of public health surveillance. Participants will examine challenges of modern public health surveillance, and discuss potential solutions, and actions and ideas for the way forward.

### **PREREQUISITES**

Basic understanding of public health surveillance

### **COURSE LEARNING OBJECTIVES**

By the end of the course, participants will be able to:

- Explain how 21<sup>st</sup> century challenges to PHS present both an opportunity for innovation and the necessity for transformation.
- Describe the evolution of PHS in the US and the challenges
- Describe the different types and approaches used for conducting PHS.
- Describe the importance of big data, internet and social media for proactive surveillance structures and systems.
- Explain the most commonly used methods for evaluation of surveillance, as well as, the newly introduced models.
- Describe the need and challenges of determining ROI, cost utility, cost effectiveness, and cost benefit analysis.
- Describe recent outbreaks and the weaknesses they have demonstrated in national and international PHS.

- Describe the importance, obligation, and authority mandated by domestic and global PHS governance.
- Identify obstacles to sharing data and samples and how these barriers should be removed.
- Define the One Health and its importance to the future of PHS.
- Define Biosurveillance and how it supports and differs from PHS.
- Recognize the importance and benefits of engaging communities in PHS.
- Identify the current efforts by the international community and WHO on interoperability and system standards.
- Describe current approaches and advances in data manipulation and data visualization.
- Describe an optimal process for policy makers, surveillance personnel, and academic modelers to collaboratively inform policy decisions.
- Explain the use of PHS to monitor the quality and capacity of health services, identify underserved populations, and inform new research priorities for ensuring health equity.
- Describe future challenges that need to be addressed for continued success in the transformation of PHS.
- Describe the technical and policy solutions that can be developed to transform PHS with an equity focus to strengthen efforts for global disease control, elimination and eradication, which leads to sustainable development.

### COURSE READINGS

- McNabb, S.J., Conde, J.M., Ferland, L., MacWright, W., Memish, Z., Okutani, S., Park, M., Ryland, P., Shaikh, A., & Singh, V. (Eds.). (2016). *Transforming Public Health Surveillance: Proactive Measures for Prevention, Detection, and Response*. Amman, Jordan: Elsevier.

### COURSE STRUCTURE

The on-line version of this course is meant to be a highly self-directed learning style that enables greater flexibility for course participants to complete the course objectives at the times and pace most conducive to the respective schedules of participants.

This course utilizes the learning management software, Canvas:

<https://canvas.instructure.com/login>

To get started all registrants will receive an e-mail inviting them to join on the first day of the course offering. Upon receiving the e-mail, participants should follow the instructions to get signed up for a Canvas account.

This is a full-length digital course, equivalent to approximately 20 hours of classroom instruction. Lectures and course material will be presented online in weekly segments. The flexible format will include video or audio recordings of lecture material, file sharing and topical discussion fora, self-assessment exercises, real-time electronic office hours and access to instructors for feedback during the course. Registrants for EPIC digital courses should have high-speed internet access.

## COURSE SCHEDULE

<b>Module 1 – Introduction</b>	
June 1 <sup>st</sup> -June 7 <sup>th</sup>	<p><u>Learning Objectives:</u> Explain why PHS must adapt to overcome new challenges presented and how these challenges also present new opportunities. Explain the process of PHS strengthening. Identify the vision for PHS that lays on the horizon.</p> <p><u>Lecturer:</u> Scott McNabb</p>

## SECTION 1. Current State of Public Health Surveillance

<b>Module 2 – Past contributions to Public Health Surveillance</b>	
June 1 <sup>st</sup> -June 7 <sup>th</sup>	<p><u>Learning Objectives:</u> Describe the evolution of public health surveillance systems US and the challenges. Identify the vision for PHS that lays on the horizon.</p> <p><u>Lecturer:</u> TBD</p>

<b>Module 3 – CDC perspectives and strategy on emerging public health surveillance issues and opportunities</b>	
June 1 <sup>st</sup> -June 7 <sup>th</sup>	<p><u>Learning Objectives:</u> Define the roles of CDC and CSTE in PHS. Describe CDC's future vision and strategic plan for PHS.</p> <p><u>Lecturer:</u> Chesley Richards</p>

<b>Module 4 – Models of public health surveillance</b>	
June 1 <sup>st</sup> -June 7 <sup>th</sup>	<p><u>Learning Objectives:</u> Describe the different types and approaches used for conducting public health surveillance. Understand the benefits and limitations to public health data from differing types of surveillance systems. Communicate the advantages and disadvantages of differing types of surveillance systems.</p> <p><u>Lecturer:</u> Meeyoung Park</p>

<b>Module 5 – Integrated versus vertical public health surveillance</b>	
June 1 <sup>st</sup> -June 7 <sup>th</sup>	<p><u>Learning Objectives:</u> Describe the differences between vertical and integrated surveillance systems. Explain the challenges involved with implementing vertical and integrated surveillance systems.</p> <p><u>Lecturer:</u> Vivek Singh</p>

<b>Module 6 – Reactive versus proactive public health surveillance</b>	
June 8 <sup>th</sup> -June 14 <sup>th</sup>	<p><u>Learning Objectives:</u> Describe the differences between proactive and reactive surveillance. Articulate how Electronic Health Records enable proactive surveillance. Describe the importance of big data, internet and social media for upcoming proactive surveillance structures and systems</p>

	<u>Lecturer:</u> TBD
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<b>Module 7 – New public health surveillance evaluation model</b>	
<b>June 8<sup>th</sup></b> <b>-June 14<sup>th</sup></b>	<u>Learning Objectives:</u> Explain the most commonly used methods for evaluation of surveillance, as well as, the newly introduced models. Describe the Work Process Analysis evaluation framework  <u>Lecturer:</u> Ngozi Erondu

<b>Module 8 – New matrix for evaluation of public health surveillance</b>	
<b>June 8<sup>th</sup></b> <b>-June 14<sup>th</sup></b>	<u>Learning Objectives:</u> Explain the most commonly used methods for evaluation of surveillance, as well as, the newly introduced models. Articulate the elements of surveillance evaluation unaccounted for within the CDC’s guidelines and the need for a new approach for evaluation.  <u>Lecturer:</u> Isabelle Devaux

<b>Module 9 – Economics of public health surveillance</b>	
<b>June 8<sup>th</sup></b> <b>-June 14<sup>th</sup></b>	<u>Learning Objectives:</u> Explain the relationship between health and wealth. Describe the need and challenges of determining ROI, cost utility, cost effectiveness, and cost benefit analysis.  <u>Lecturer:</u> Rebecca Katz

<b>Module 10 – Supply and demand of the public health workforce</b>	
<b>June 8<sup>th</sup></b> <b>-June 14<sup>th</sup></b>	<u>Learning Objectives:</u> Describe the need for workforce development and capacity strengthening in epidemiology and its impact on public health surveillance.  <u>Lecturer:</u> Jeff Engel

## SECTION 2. Governance Unlocks Transformation

<b>Module 11 – Keeping our world safe by integrating public health and global security</b>	
<b>June 15<sup>th</sup></b> <b>-June 21<sup>st</sup></b>	<u>Learning Objectives:</u> Describe recent outbreaks and the weaknesses they have demonstrated in national and international public health surveillance systems. Describe the importance, obligation, and authority mandated by domestic and global PHS governance. Identify global alert systems and their future to protect global health security. Describe global best practices for PHS governance  <u>Lecturer:</u> David Heymann

<b>Module 12 – Smart Governance of Public Health Surveillance</b>	
<b>June</b>	<u>Learning Objectives:</u> Describe global best practices for PHS governance. Define the

<b>15<sup>th</sup> -June 21<sup>st</sup></b>	<p>statist vs. globalist points of view for global health surveillance. Identify appropriate ethical considerations on both the individual and population levels. Identify why countries may be hesitant to share data and samples and how these barriers should be removed.</p> <p><u>Lecturer:</u> Affan Shaikh</p>
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### SECTION 3. Collaboration Fuels Transformation

<b>Module 13 – One Health in the 21<sup>st</sup> century</b>	
<b>June 15<sup>th</sup> -June 21<sup>st</sup></b>	<p><u>Learning Objectives:</u> Define the one health approach and its importance to the future of PHS. Identify the current efforts and systems that are using the one health approach. List examples demonstrating the intersection between human health, animal health and environmental health.</p> <p><u>Lecturer:</u> Jonna Mazet</p>

<b>Module 14 – Collaboration for biosurveillance</b>	
<b>June 15<sup>th</sup> -June 21<sup>st</sup></b>	<p><u>Learning Objectives:</u> Define Biosurveillance and how it supports and differs from PHS. Describe the DOD’s future vision for Biosurveillance and how they plan to achieve this vision.</p> <p><u>Lecturers:</u> Andy Weber and Julia Doohar</p>

<b>Module 15 – Contributions of military public health surveillance to global public health security</b>	
<b>June 15<sup>th</sup> -June 21<sup>st</sup></b>	<p><u>Learning Objectives:</u> Describe the role that military can and has played in public health. Identify the US DoD’s current initiatives to improve collaboration and information sharing.</p> <p><u>Lecturer:</u> TBD</p>

<b>Module 16 – Nonprofit associations and cultivating collaboration to advance public health surveillance</b>	
<b>June 15<sup>th</sup> -June 21<sup>st</sup></b>	<p><u>Learning Objectives:</u> Explain the role and importance of associations in PHS. List different types of associations.</p> <p><u>Lecturer:</u> Laura Streichert</p>

### SECTION 4. Informatics Enables Transformation

<b>Module 17 – The human interaction required for visualizing and manipulating information</b>	
<b>June 22<sup>nd</sup></b>	<p><u>Learning Objectives:</u> Describe current approaches and advances in data manipulation and data visualization. Describe how machine learning approaches</p>

-June 28 <sup>th</sup>	are relevant to public health surveillance.  <u>Lecturer:</u> Matt Dollacker
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<b>Module 18 – How Informatics Were Leveraged During the Ebola Outbreak</b>	
June 22 <sup>nd</sup> -June 28 <sup>th</sup>	<u>Learning Objectives:</u> Describe how informatics fill in gaps during public health emergencies. Explain the advantages informatics provide to dated PHS systems.  <u>Lecturer:</u> Adam Thompson

<b>Module 20 – Governance Issues in PHS Informatics</b>	
June 22 <sup>nd</sup> -June 28 <sup>th</sup>	<u>Learning Objectives:</u> Understand the agreements – formal and informal – essential for informatics to operate efficiently and ethically. List the components necessary in such agreements.  <u>Lecturer:</u> Brian Dixon

<b>Module 21 – Destructive Innovation in Public Health Surveillance</b>	
June 22 <sup>nd</sup> -June 28 <sup>th</sup>	<u>Learning Objectives:</u> Understand how innovations in informatics are transforming PHS. Describe the term destructive innovation. Give specific examples and explain processes of informatics.  <u>Lecturer:</u> Joy Sylvester

## SECTION 5. New Data, Analytics, and Intelligence (Knowledge) Enlightens Transformation

<b>Module 22 – Necessary Challenge of Verifying and Validating Public Health Data</b>	
June 22 <sup>nd</sup> -June 28 <sup>th</sup>	<u>Learning Objectives:</u> Discuss the balance of key attributes in a surveillance system. Identify potential sources of error in surveillance data systems. Describe best practices for validation and verification of surveillance system data.  <u>Lecturer:</u> Richard Hopkins

## SECTION 6. Impacts of Transformed Public Health Surveillance

<b>Module 23 – Research and innovations guiding public health surveillance in the 21<sup>st</sup> century</b>	
June 22 <sup>nd</sup> -June 28 <sup>th</sup>	<ul style="list-style-type: none"> <li><u>Learning Objectives:</u> Describe the future challenges that need to be addressed for continued success in the transformation of PHS. Explain how research and innovation have and will continue to shape public health surveillance.</li> </ul> <u>Lecturer:</u> Paige Ryland

**Module 24 – Innovations Public Health Surveillance in mHealth**

**June 22<sup>nd</sup>**      Learning Objectives: Define mHealth. Give examples of how mHealth supports PHS. Explain future opportunities mHealth offers to PHS.

**-June 28<sup>th</sup>**      Lecturer: Marion McNabb